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ABSTRACT

This booklet provides information on cooperative agreements between college and industry, focusing special attention on such agreements in energy-related fields. After highlighting the major elements of cooperative agreements and their benefits and potential problems, the report examines the economic context in which joint activity between colleges and industry must operate; outlines current national economic problems; discusses the Reagan administration's proposed solution to these problems and the impact of Reagan's economic recovery plan on federal agencies; and assesses the potential contributions which community colleges can make to the resolution of these problems. Next, a full case study of a cooperative agreement between Edmonds Community College and the Public Utility District Number 1 of Snohomish County, Washington, is provided, followed by five brief case studies, and 32 case study abstracts of current projects involving two-year colleges and industry in 21 states. The North Carolina State Economic Development Model is then described. The following section provides an analysis of cooperative agreements; identifies some of their special characteristics; highlights several models; points to benefits and problems associated with their implementation; and offers advice for developing joint college/industry activities. Appendices provide a formal overview of federal economic policies since the 1930's, an example of a formal written agreement, and a bibliography. (HB)

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SHOULDERS TO THE WHEEL

Energy-Related College/Business Cooperative Agreements

Mary Jane G. Jackman
James R. Mahoney

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American Association of Community and Junior Colleges
Energy Communications Center
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Hercules and the Waggoner

A waggoner was once driving a heavy load along a very muddy way. At last he came to a part of the road where the wheels sank halfway into the mire, and the more the horses pulled, the deeper sank the wheels. So the Waggoner threw down his whip, and knelt down and prayed to Hercules the Strong. "O Hercules, help me in this my hour of distress," quoth he. But Hercules appeared to him, and said: "Tut, man, don't sprawl there. Get up and put your shoulder to the wheel."

. . . from The Fables of Aesop

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Authors' Notes

This booklet's purposes are to give readers useful information about cooperative agreements, to provide a sense of their increased significance by placing them in context with national economic circumstances, and to stimulate greater correspondence between the colleges and local business. It is a descriptive paper, not a prescriptive one.

Much of the material captured in the case models is original, generated by the AACJC Energy Communications Center staff. The other material is derived from a collection of resources that examine the multiple components that are part of this general issue.

Special attention is paid to the application of cooperative agreements in energy-related industries. For this paper, the expanse of energy-related industries encompasses not just energy producers; it also takes in those industries involved in plant construction, facilities maintenance, and transportation. The application of the concept is equally valuable in all industries and for all colleges.

For convenience and to avoid unnecessary repetition, we have used the terms "private sector," "business," "industry," "firms," and "companies" interchangeably. We recognize that there are distinctions among these terms, but we felt that clarifying them would contribute little to the paper's substance.

Also, in using these terms we mean to include organized labor unions as principal contributors. The unions are most obviously involved with colleges in labor studies and apprenticeship programs. But they are also integral parts of the industry side of cooperative agreements – particularly in those agreements initiated in urban centers and in larger firms. In fact, in these situations, the agreements might not be possible without union agreement.

Finally, in those sections touching on the nation's falling productivity, readers should not infer that the problem is caused essentially by an inefficient workforce. Improving workers' skills and training technicians to reduce manpower shortages in the skilled trades can help improve productivity. But other important considerations relating to the question should be understood. They include the negative effect on productivity of both poor management practices and the growth of service industries.

Acknowledgements

The topic of this technical assistance paper was one of several presented in 1980 to the U.S. Department of Energy, Office of Energy Research, as part of the AACJC Energy Communications Center's request for continuation funds. Two topics were to be selected for development. The first paper of this series was *Alcohol Fuel Production, Manpower, and Education: Where Do Two-Year Colleges Fit?* It was published in 1981.

Shoulders to the Wheel is the second paper. It emerged from other possible topics because of the new economic initiatives introduced by the Reagan Administration.

Office of Energy Research officials Richard Stephens and Lawrence Akers (federal program representative) encouraged its production. Dr. Akers assisted directly at various stages.

On November 6, 1981, in Washington, D.C., a small group of college and private sector representatives met to discuss issues related to cooperative agreements. The staff collected an abundance of information from the meeting.

The college representatives were:

Keith Allen
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All are members of the project's national advisory committee.

The business representatives were:

Tony Arnold
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Ken Kinner
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Casper, WY

Marvin Mantooth
Chevron U.S.A., Inc.
New Orleans, LA

James O'Bannon
Richard Heath & Associates
Fresno, CA

Jack Smith
Public Utility District #1 of Snohomish County
Everett, WA

These private sector officials were chosen because each works directly with one of the committee colleges.

The full-day meeting was dynamic and productive. One of its results was the full and brief case models that are included in this paper. The business officials enthusiastically endorsed the concept and left the meeting excited about the capacity and willingness of two-year colleges to work with local business.

Both committee members and business representatives reviewed an early draft of the booklet and provided suggestions.

In the research and drafting stages, several individuals from national organizations graciously offered suggestions, information, and guidance. They included:

Edgar Czarnecki, AFL-CIO, Washington, D.C.

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Roger W. Liska, Associated Builders and Contractors, Washington, D.C.

Leo P. Mahoney, associate professor of economics at Bryant College, Rhode Island, who, in reviewing the entire draft, offered special assistance with the Reaganomics section

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Sylvia Forsythe, AACJC Publications Office, lent her expert hand in editing the final draft.

Original drawing contributed by Marie E. Mahoney

Summary

Community colleges have a long history of working effectively with local business. Cooperative relationships of these kinds are manifestations of the colleges' philosophy – providing high quality educational services and programs in response to community needs. President Reagan's new policies have made such relationships more significant – even essential. The policies require that state and local agencies and organizations pool their resources to address their own needs. The Administration has placed much of the responsibility of this effort on the private sector, partly because new federal policies have concentrated on providing economic incentives for it.

The national stress now falls on curing the country's economic ills. Improvement in productivity is one important means of achieving this goal, and one way to improve productivity is to upgrade the quality of the workforce through training and education. Through cooperative agreements with business, community colleges can contribute importantly to workforce improvement.

In the energy field, the reduction of federal support has most affected conservation, alternative, and renewable energy programs. The U.S. Department of Energy's principal interests now are in long-term, high-risk research and development (especially nuclear programs), high energy physics programs, and energy activities related to national defense. Development of "already proven" technologies is left to the marketplace. Most of these technologies are being developed by small businesses, those most vulnerable to fluctuating economic circumstances. Many of these technologies are of special interest to individual do-it-yourselfers. For these reasons and others, the colleges have a unique role to play in this area.

Cooperative agreements most frequently involve: plant-specific training under contract with a local employer; equipment use or donation; industry assistance in developing programs, providing materials, monitoring progress, providing support funds, and detailing job and skill requirements; faculty assignments within industry; program publicity; industry personnel as part of the instructional force; facilities sharing; and on-the-job training.

The benefits of cooperative agreements include:

- For industry: low-cost, high-quality training specifically tailored to its needs; flexible, adaptable, reliable, and fixed human resource development institution with special interests in the firms' success; and a fecund source of future employees.
- For colleges: opportunity to meet their philosophical responsibilities; enhancement of programs; establishment of cooperative patterns (and a reputation) that can create long-term relationships with industry; and increase in revenues.
- For students: hands-on experience with state-of-the-art equipment and firsthand knowledge of workplace requirements; for already-employed workers, skills upgrading opportunities that can ensure employment and open new opportunities.

- For communities: the development of an education and training resource capable of attracting new business and maintaining current businesses, thereby ensuring its economic health; reduction of the need for industry to bring in workers from other locations; and enhancement of an objective, dependable energy information center for broad community use.

The elements of effective cooperative agreements include:

- A written agreement that specifies in clear language the tasks to be performed, purposes, responsible persons, timeline, evaluation/monitoring procedures, locations where work will be performed, the contributions of each party, and the management approach.
- Willingness of the college and industry to listen carefully to one another, to compromise "territorial" concerns that might interfere unnecessarily with the creation of a successful program, to recognize and accept the special contributions each can make to the program, and to understand their distinctive interests.
- Scheduled meetings between program liaison persons.
- Commitment of executive personnel of each organization.
- Creation of a "working" advisory committee (depending on the extensiveness of the program) composed of both college and industry personnel to guide the program.

While there are many benefits colleges can gain from cooperative agreements, there are some dangers. They include:

- The possibility that with the expansion of such programs colleges could lose sight of their unique goals; i.e., to prepare students to ". . . live lives of dignity and purpose. . . . to assist students to use new learning to humane ends. . . to help shape a citizenry that can weigh decisions wisely and more effectively promote the public good."
- The chance that other important program commitments could be diminished; i.e., an expanded focus on petroleum technology while existing programs in conservation, renewable, and alternate energy are jeopardized.
- The possibility of faculty disenchantments produced by the addition of technical faculty who may require substantially higher salaries.
- The potential of losing faculty to industry.
- The possibility of over-reliance on these essentially short-term programs to support the college, a situation that could undermine the economic base of the college were the industry to withdraw (for a number of reasons) its participation.
- The possibility that industry's specific training demands, and the college's eagerness to provide what is required, may threaten the college's responsibility for providing a program that is consistent with the standards that it applies for its on-campus programs.
- The possibility that stated industry needs may shortcircuit college creativity in identifying and creating new jobs in industry.
- The prospect that a focus on job-specific training can limit the general employability of workers and reduce the adaptability of the workforce.

Handled sensitively, cooperative agreements can make significant contributions to local, regional, and national economies and can help satisfy the special interests and needs of both education institutions and businesses.

Introduction

Introduction

In many respects cooperative agreements are simple arrangements. They represent the converging interests of two community groups, very different from one another, but with complementary needs. The colleges, on one hand, are motivated by a community service philosophy and a need for industry know-how and equipment to ensure that their occupational programs are current. On the other hand, industries have needs for employees with specialized training, training that industries frequently cannot provide themselves. The marriage is a natural, uncomplicated one.

But the national context in which it occurs is complex. It involves a myriad of conditions, disciplines, and positions that have served to elevate relationships between colleges and business from a commonplace, unremarkable activity to one of vital national importance.

National Interest in College/Business Cooperation

The importance of cooperative agreements is demonstrated by the explosion of special offices, surveys, task forces, and materials that have been generated by national organizations (education and business) and the Reagan Administration. Examples are:

- The American Enterprise Institute has established a new Center for the Study of Private Enterprise. The Center will prepare a report for the President on the expanded role the private sector could take in providing social services. As part of this effort, the Center plans to examine how private industry training programs might play a larger role in education nationally.[1]
- The American Council on Education and the American Society for Training and Development are compiling a directory of cooperative agreements between higher education institutions and business.[2]
- The U.S. Department of Education, Office of the Assistant Secretary of Adult and Vocational Education, has formed a Task Force on the Private Sector. The group's central purpose is to establish a national organization, operated and supported by private firms, to encourage economic development and appropriate vocational education at the local level. The program stress is expected to fall on cooperative education.[3]
- The National Alliance of Business (NAB) has established a national clearinghouse for job training programs that are models of private sector initiatives. Information specialists screen material collected from corporations, colleges, unions, private industry councils and other sources. Selected case studies are published and placed in a computerized data

base for ready reference. Clearinghouse staff provide tailored research services on training related to specific occupations, coping with plant closures, retraining workers, and other topics.[4]

- The U.S. House of Representatives' Budget Committee has formed a Task Force on Economic Policy and Productivity. The Task Force's human resources panel will take a close look at education and training programs and their impact on productivity.[5]

National Economic Problems

The activities noted above respond to the troublesome condition of the U.S. economy and to President Reagan's economic recovery program. Some of the country's economic circumstances are noted below:

- Most of the country's economic indicators are negative.
  - Unemployment reached 8.9 percent (nearly 9.5 million people) in December 1981, and some economists believe that it will rise to 10 percent in 1982.
  - While 13 million new non-agricultural jobs were created between 1973 and 1979, the expansion was concentrated in low wage and service areas. The new jobs were characterized by shorter hours and low pay; they lacked career advancement potential. The persons who filled these jobs were for the most part women and new participants in the workforce.
  - For the period 1963 to 1975, this country's share of the world's skilled workforce fell from 29 percent to 26 percent. Also the U.S. has dropped from second to seventh place among industrialized countries in our workforce's measured "skilled endowments."[6]
  - Inflation has continued in double-digit figures, and interest rates remain on the average in the middle-teens.
  - Productivity declined during 1980, the result of reductions in hours worked and in output. In the private business area, it declined 0.4 from 1979. It was the third consecutive year that American productivity fell. Economists suggest that some possible reasons for the decline include: increases in energy prices, the high cost of capitalization, unchanged tax and depreciation provisions, and a slower growth of effective workers.[7]
  - The U.S. had positive trade and manufactured goods balances up to the 1970's. For the period 1977–79, however, the nation's overall trade deficit averaged over $25 billion each year. (One of the reasons for this reversal was the huge increase in the cost of imported crude oil. In 1973, for example, a barrel of imported crude oil cost $4.08; in 1980 the same barrel cost $33.89.) In 1980, the U.S. trade balance was $4.5 billion – Germany's was $59.2 billion and Japan's was $72.0 billion.[8]
- While the numbers of unemployed persons in this country are very high, there are large numbers of people employed whose earnings are below the poverty level. In 1980, for example, 5.5 million persons in the labor force for 50 weeks or more had incomes below the poverty line, even when their earnings were combined with those of other workers in their families. Fifteen million people during 1980 did not earn the equivalent of the minimum wage for the hours they were willing and able to work.[9] Most of these workers share the characteristics of the structurally unemployed; that is, they are people who do not have the necessary academic and working skills required for most jobs.

- The U.S. faces a severe shortage of skilled manpower. The Associated Builders and Contractors, Inc., representing the construction industry, reports that by 1990 approximately 900,000 new skilled construction workers will be needed, 85,000 of them in the synfuels area. During the same period, about 1.5 million workers currently on the job will no longer be available because of retirement and other reasons. Current training programs produce 50,000 skilled workers each year, or less than 25 percent of the workers needed. The difference between what is needed and what will be available is 1.9 million workers.[10] Also, the Task Force on the Skilled Trades Shortage, a coalition of trade organizations representing 32,000 plants, $50 billion in sales, and one million employees nationwide, reports that there will be a need for 23,000 new tool and die makers and machinists each year through 1990. Only 5,000 individuals completed their registered apprenticeships in these trades in 1978, and only 47 percent of those who began the program completed it. Also, the Task Force reports a backlog demand for 60,000 skilled metalworking journeymen and an anticipated need for 240,000 journeymen by 1985.[11]
- The apprenticeship system in this country is one of the major sources of trained, skilled manpower, yet it is not producing nearly the number of graduates required by the economy. During 1980, approximately 420,000 registered apprentices received training in approved programs; 125,000 of this number were newly registered students. The military services registered an additional 16,000 apprentices. Approximately 50,000 apprentices completed the program during the year. The national program was expanded during the year to include 19,000 apprentices in the production, distribution, and conservation of energy, including nuclear energy, solar energy, fossil fuels, biomass, and weatherization.[12]
- U.S. Bureau of the Census estimated current figures and projections on working-age adults show the following:

Ages	1980	1990	2000
All ages	222,159,000	243,513,000	260,378,000
18–25	33,438,000	28,997,000	27,851,000
26–35	35,048,000	41,259,000	35,138,000
36–44	22,873,000	32,568,000	37,457,000
45–54	22,698,000	25,311,000	35,875,000
55 and over	46,125,000	50,601,000	55,079,000

  The numbers demonstrate that the American workforce is aging, that the pool of young workers will decline significantly in the next two decades, and that the loss of skilled workers will be accelerated during this period – all factors that can exacerbate already existing manpower problems.[13]
- Federal policies that provide incentives to business to stimulate production and create greater numbers of jobs have been ineffective. According to a recent report, 67 percent of all new jobs are created by small firms with 20 or fewer employees and 80 percent are generated by firms with 100 or fewer employees.[14] Federal policies have tended to concentrate on the larger, more stable firms that have a small capacity for job-creation. One reason for this focus is the large number of smaller firms and the attendant difficulty to monitor them. For example, in New England there are approximately 193,000 businesses with 20 or fewer employees and another 27,000 firms with 20 to 500 employees.[15]

- The United States does not have a cohesive, comprehensive human resource development policy.[16] Rather, it has a smattering of manpower programs with the primary components contained separately in different federal jurisdictions. The significant components include education, labor market research, industrial analysis, human resource development, and quality of worklife analysis.[17] Our approach contrasts sharply with other world industrial leaders. In West Germany, for example, the government and industry operate on the philosophy that the workforce is the most significant resource to invest in to ensure economic growth. As a result, every adult in the country has the right to two years of fulltime training or retraining. Under this system all training costs are subsidized by the government and the industry pays up to 90 percent of the person's last wage.[18] A number of U.S. labor economists have urged the revision of our CETA system so that an appropriate emphasis is given to developing long-term employability skills in the unemployed and the underemployed. They have also argued for the adoption of a support system like the GI bill to provide the same kind of resources for training and retraining that are available in other industrial nations.[19]

Reagan Administration Economic Recovery Plan

In response to these circumstances and others, the Reagan Administration introduced its economic recovery plan.

In his televised address to the nation on February 5, 1981, President Reagan said: "It's time to recognize that we've come to a turning point. We're threatened with an economic calamity of tremendous proportions and the old-buisness-as-usual treatment can't save us. Together, we must chart a different course."

His "different course" contrasts sharply with that taken by previous administrations. He breaks with traditional Keynesian ideas (espoused by administrations since the early 1930s) and seeks to attack both inflation and unemployment by redefining the role of the federal government. In the Reagan approach "free market forces" determine production levels and employment. The balance between growth and inflation is the charge of the private sector, not the government. The government's role is to withdraw from direct involvement with the marketplace and to eliminate or reduce existing federal programs that restrict private enterprise. In contrast to the demand-side strategies of earlier administrations, Reagan's focus falls on supply-side economics.

According to President Reagan, federal government initiatives have depressed production and encouraged only consumption, through high taxes, excessively rapid money growth, and government regulations. By cutting back government growth and returning the country's resources to the states and individuals through a series of tax cuts, Reagan predicts an environment for "work, savings, and investment" that will foster an innovative, growing economy. Under the President's plan, budget cuts and strict monetary policy will control inflation.[20] While the federal government will continue its support of the military and ensure the welfare of dependent groups of citizens, it will no longer attempt to control demand.[21] Rather, the government will spur supply to achieve economic growth and lower inflation.

President Reagan underscored the tenets of his plan on January 26, 1982, in his first State of the Union message.

(A fuller treatment of federal economic policy development over the past 50 years and President Reagan's economic recovery plan are presented in Appendix A.)

Policy Impacts on Federal Agencies

The impact of the Reagan plan on federal agencies that have primary responsibility for manpower programs has been dramatic.

The Administration has promised to eliminate the Cabinet status of the U.S. Department of Education. It believes that education is primarily a state and local responsibility. In preparation for this change, 12 percent of the Department's 1981 fiscal year budget was rescinded; its 1982 fiscal year funds have been set at $12.9 billion, a six percent cut; and its 1983 budget is expected to be approximately $10.6 billion, an additional 18 percent cut. Other elements of the Administration's approach are:

- Elimination of regulations covering a variety of programs,
- Consolidation of many categorical, special audience programs into block grants, and
- Deemphasis on the resolution of social problems (poverty, segregation, equity, and others) through education and emphasis on economic issues to which education can contribute; i.e., basic academic competencies, performance standards, and job training.

Reagan Administration priorities appear to favor stresses on back-to-basics programs; encouraging the growth of private schools as a means of establishing competitors for the public school system, stimulating public education improvements, and providing parents with choices for their children's education; prompting the involvement of the business community in local education to infuse programs with reliable information about the marketplace and to strengthen the work ethic; and focusing special attention on occupational programs to contribute to the communities' economic health.[22]

The impact of these strategies can be devastating. For example, in fiscal year 1980, the federal government spent $655 million on vocational education. Only $78 million of this total went to postsecondary institutions. The federal contribution has in the past triggered state expenditures on a ratio of $12 for every federal dollar. Given the condition of most state budgets, the likelihood is the states will not be able to make up the difference in reduced federal funds, and, in fact, they might reduce the percentage of their own contributions.

While the Administration's plans for CETA programs are not yet in final form, the indications are that the scope of these programs will be reduced substantially and that the federal government will retreat from involvement in them. In fiscal year 1981, the total funds for CETA were $7.6 billion; in fiscal year 1982, they are $4.6 billion, a reduction caused primarily by the elimination of the public service jobs program; and in fiscal year 1983, the proposed budget is $2.387 billion. The position of the government regarding CETA appears to be that "The employment and training system should not and cannot be expected to significantly raise the aggregate level of labor productivity, nor significantly lower the aggregate rate of unemployment."[23] As with other federal programs, the government is placing heavier reliance on the private sector to address these two circumstances.

The new stress of the U.S. Department of Energy falls on long-term, high-risk research and development. Where it formerly provided broad support for conservation, alternatives, and renewable energy resource demonstrations and research, it is now leaving this work to the private sector. Its position is that these technologies have already been proven and that, if there is worth in any of them, it will be proven in the marketplace. Development of these sources, therefore, is left with little government support. Studies have shown that conservation, alternative, and renewable energy sources can make significant contributions to national energy needs. The suggestion is these reports (see Stobaugh and Yergin, for example) that before these contributions can be fully realized, the private firms involved in energy production in these areas must be nurtured by the federal government. Most, if not all, of the private sector enterprises in the field now and those to follow will most likely be small operations. As in most such firms, a good part of the capitalization will come from personal savings.[24] Such firms can not afford to engage in the kinds of activities that would help them prosper. These activities include

job-specific training, research and development, public distribution of information about the reliability and usefulness of their products and services, and information collection to trigger innovation and improvement. Without such activities, the firms would have an even more difficult time generating capital from financial institutions to expand their operations – or to survive.

Conservation, renewable, and alternative energy enterprises are relatively new. Like other new industries, it takes time for them to take hold. The federal support offered these areas in the past established a beginning for them. The abrupt withdrawal of federal support hampers their transition from struggling, personal enterprises to healthy, self-sufficient ones.

The use of these energy sources has made important contributions to the national domestic energy supply. For example, U.S. energy consumption grew at an annual rate of 2.3 percent between 1967 and 1978; in 1979, primarily as a result of increased use of conservation strategies and applications of alternative and renewable sources, the annual consumption grew by only .005 percent. In 1979 U.S. oil consumption declined 1.7 percent, while consumption increased in all other countries. Also, in 1979 the nation's net imports of crude oil and refined products totalled 7.9 million barrels per day, a reduction of more than 8 percent from the 1977 total of 8.6 million barrels per day.[25]

Many of the programs that stimulated these changes in national energy consumption were separate, categorical programs administered by the Department of Energy. Several are now collapsed into block grants. An example of how block grants capture several former programs is shown in Senate Bill 1544, introduced by Senators McClure and Domenici on July 30, 1981. The bill is titled "The State and Local Energy Block Grant Act of 1981." The bill proposes to allocate $200 million to the states on a formula for each of fiscal years 1982, 1983, and 1984. Allowable activities for the use of these monies involve energy conservation and supply activities, including: energy conservation; energy conservation measures and weatherization in public or non-profit institutional buildings, including schools, hospitals, public care institutions, and local governmental buildings; weatherization for low income persons; residential and commercial building conservation; residential and commercial energy audits and technical assistance; energy emergency preparedness; renewable energy research, development, and demonstration; energy supply, research and development; transportation energy efficiency; and energy conservation and supply development in the agricultural sector.[26] The amount of funds available through the separate programs exceeded the total reserved for this block grant. (At this writing, no action had been taken on this bill.)

Community College Characteristics and Capacities

The two-year colleges in this country can make important contributions to the resolution of the issues noted above. Their development over the past two decades and the experiences they have gained during this time suggest their interest and capacity.

The number of two-year colleges exploded from 663 in 1960 to 1,234 in 1980. Enrollments for the same period grew from 660,233 to 4,825,931.[27] In 1965, 14 percent of the 1.3 million students enrolled in comunity colleges were in occupational education programs.[28] In the 1979–80 academic year, 63 percent of the 4.3 million credit students in the colleges were in occupational programs.[29]

The latter change suggests the evolution of two-year colleges from predominantly transfer colleges in their early history to comprehensive colleges that offered a variety of educational opportunities including transfer, occupational, and continuing education programs. In the past few years, as the national economy vacillated between recovery and recession, as the special capacities of the colleges achieved recognition, the colleges' occupational component assumed predominance. Currently, the colleges offer more than 1,400 different occupational specialty/

technician programs, including degree, certificate, diploma, and non-credit opportunities.

The colleges are tied intimately to local business through their administrative structure. The members of local colleges' Boards of Trustees are usually drawn from the business community, an arrangement that provides the private sector a direct hand in college policy-making and gives them insight into the services that the colleges can provide.

Also, nearly all occupational programs in the colleges are served by advisory committees composed of community professionals working in specific occupational areas related to individual curricula. Most colleges appear to have 20 to 50 occupational programs with an advisory committee of practitioners and employers for each. Frequently, at one time several hundred community people are working directly with a college in this capacity.[30]

These advisory committees contribute significantly to their respective curricula, providing information on the technological state-of-the-art, job opportunities for graduates, and advice on the work qualities and technical skills that employers want. The committees have also assisted with outside funding for special program components, procurement and/or donation of training equipment, creation of industry work opportunities for faculty to update their skills and information, and help in arranging cooperative agreements between the colleges and firms that directly benefit the college, business, students, and the community.

Further, the parttime instructors employeed by the colleges are generally local practitioners who provide another direct link with the private sector.

College characteristics that make them particularly suitable for working directly with local business and industry include:

- They offer low-cost, high-quality training. For example, average tuition costs for two-year colleges in 1980–81 were $450 per year.
- They provide adaptable and flexible programs. As much as it is possible, the colleges bring training to the student, whether that is in the local plant, church, motel, high school, union hall, or some other location convenient to the learners. They are generally willing and able, with the expert advice of industry and of other training users, to adjust, adapt, and alter programs to meet the specific needs of the users.
- They are capable of presenting a range of programs from developmental learning activities to technician programs, and from entry-level, to retraining, to management instruction.
- They can adjust scheduling to meet the demands of the learners.
- They have substantial experience with apprenticeship programs, in concert with both labor unions and company managers.[31]

Case Models

The following section contains a series of case models on existing cooperative agreements. The first entry is a full case study, the next five are briefer studies, and the following 32 are program abstracts. The final model offers an outline of a comprehensive state economic development approach.

These models provide an array of the energy-related agreements operating now. It is not an exhaustive list, but the material displays the richness and variety of the programs.

The information comes from several different sources:

Source "A" material came from college submissions to AACJC as a result of requests contained in the August 21, 1981, and October 21, 1981, issues of the *AACJC Letter*.

Source "B" material was collected through the November 1981 Energy Communications Center survey of approximately 90 colleges.

Source "C" studies are modified versions of programs described in *Sharing Resources: Post-secondary Education and Industry Cooperation*, a text prepared by The Ohio State University National Center for Research in Vocational Education. Project staff collected additional data from the colleges for each of these models.

Source "D" entries were collected at the November 6, 1981, AACJC meeting on energy-related cooperative agreements.

In a few cases, other information sources were used. They are identified in the descriptions.

Case Models

Full Case Study

Source D

Edmonds Community College
Public Utility District Number 1 of Snohomish County, Washington

Program Title: Consumer Home Energy Check (CHEC)

Contact Persons

College

Elaine Weitz, *Coordinator*
Energy Management Programs
Edmonds Community College
20000 68th Avenue, West
Lynwood, Washington 98036
(206) 771-1500

Utility

Jack Smith, *Supervisor*
Residential Energy Program
Snohomish County Public Utility District Number 1
2320 California Street
Everett, Washington 98206
(206) 258-8214

The College

Edmonds Community College opened its doors in July 1967. It is a comprehensive college offering programs in college transfer, occupational studies, general studies, and community services. In the 1979-80 academic year, the college enrolled 2,201 fulltime students and 5,121 parttime students.

The college is part of the statewide network of 27 local colleges that are administered by the State Board for Community College Education. Its financial support is derived from state per student revenues. By the end of this decade the college expects to enroll approximately 5,000 fulltime students.

The Community

Snohomish County is one of the fastest growing areas of the state. Its population is 335,953, a 26.7 percent increase over the 1970 figure. The largest city in the county is Everett, with a population of 54,351. Approximately 44 percent of the population is under 35 years old.

Manufacturing firms make up 33.7 percent of the employers in the county, and wholesale/

retail, government, and services compose 22.1 percent, 17.2 percent, and 15.0 percent respectively. The manufacturing sector includes foresting, fishing, mining, and others. The county has progressed from a one industry economy (forest and wood products) to an area that has attracted major manufacturing firms in aircraft, electronics, boat building, specialty chemicals, concrete and glass products, communications equipment, and numerous warehousing and distribution activities. The largest employer, The Boeing Company, has 16,500 employees. There are 167,000 people in the county's labor force: 8.6 percent are unemployed. There are 16,380 registered businesses in the county.

Over 75 percent of the county is forested – about one million acres. Dairying accounts for 60 percent of the annual agricultural revenues in the county.[32]

The Utility

Snohomish County Public Utility District Number 1 is the largest public utility in the state. It provides electricity and some water services to 147,000 customers at 2.43 cents per kilowatt hour for residential customers during the winter and 2.2 cents per kilowatt hour during summer months. It employs approximately 740 people. The utility services all of Snohomish County, located just north of Seattle, and covers in total 2200 square miles. Its main office is located in Everett, Washington.

Background

The National Energy Conservation Policy Act of 1978 (Public Law 95–619) required that all utilities generating 750 million kilowatt hours or more per year establish a Residential Conservation Service (RCS). Part of the RCS program was to include a home energy service, designed to offer home owners a professional, low-cost or no-cost audit of home energy use with suggestions on what individual owners might do to reduce energy use. Also, the audit was to give information on the payback period for various conservation measures. Even before the Act was made law, the utility established a conservation office, began putting a staff together, developed an RCS program, started a low-interest loan program for retrofit activities, and advertised its services to its customers. The community responded quickly and enthusiastically to the opportunity. Very quickly a backlog of 2200 requests for home energy audits developed. By law, the utility had to respond to requests within 60 days or report their difficulties to the U.S. Department of Energy. Sixteen additional trained, fulltime employees would have been required to reduce the backlog. Anticipating that the requests would ebb and flow over time and not wanting to commit itself to hiring fulltime employees whose services might not be needed consistently, the utility decided to investigate the possibility of working with second-year students in Edmonds Community College's Energy Management associate degree program. Two other options for solving the problem were to pay overtime to present employees or contract with an outside firm. Both options would have been expensive.

The college had developed a relationship with the utility long before the RCS plan was created. The college's Energy Management degree program was implemented in 1979. As part of the creation process, college staff visited utility officials to talk about the program, to request materials that might be useful in the curriculum, and to ask for guidance regarding program content. Also, utility executives participated on the program advisory committee and, in the first several months of the program, some utility officials were hired as adjunct faculty for the program.

So when the utility needed assistance to meet its RCS obligations, the college was prepared to help. An atmosphere of mutual respect and trust had been developed. The result was a professional services contract between the college and the utility and the successful administration of a public service program that benefitted the utility, the college, program students, and community residents.

Program Details

The professional services contract was signed by both parties on February 6, 1981. Its completion date was December 31, 1981. The college and utility have signed a second agreement extending the contract through 1982.

Under the conditions of the contract, the college is required to hire at least nine qualified students to conduct home energy analyses on Friday, Saturday, and Sunday of each week during the course of the agreement. (Utility analysts work Monday through Thursday, 10 hours per day.) Each employee/student must complete three audits each of the three days, and each audit must last at least two hours. The teams of participants are required to conduct 81 audits each weekend.

The college solicited participants for the program from the second year students enrolled in the Energy Management program.

The college is responsible for assigning a program administrator whose tasks include record keeping, student assignments, and liaison with the utility. The college also certifies that every student employed in the program has received special utility training.

The utility also agreed to designate a coordinator for the program, provide equipment for the audits, deliver lists of scheduled appointments for audits, and generally coordinate program activities with the college administrator.

In addition, the utility agreed to pay the college $30 for every confirmed audit completed by the students. It stipulated that it would not be responsible for any insurance claims made by the student analysts nor for their transportation costs.

Soon after the contract was signed, the college invited student applications. Twenty students were selected in the first round. Five were added later. Although the participants are college students, they represent the utility at the customer's home. To ensure that they represent the company well before the public, the utility organized a special two-day (Saturday and Sunday) training program. Topics included: the history and policies of the utility, rate structures, selling conservation to homeowners, conducting an audit, computer terminal operation, and the utility's loan program. At the end of the session, participants are given an exam. Those who pass are certified to participate in the program. Following certification, participants are required to complete three audits during one week under the supervision of a specialist employed by the utility.

The college awards two college credits for this training, and awards one credit for each 18 audits completed by a participant.

Through November 1, 1981, the program participants had completed 2,206 home audits.

Benefits

To the college:

- Of the $30 per audit that the utility pays the college, approximately $2.50 accrues to the college and is used to support the Energy Management program in the form of equipment purchases, curriculum materials, outreach, field trips, and other educational activities. The student is paid $21 for each confirmed audit. The remainder is used to cover student/worker fringe benefits, a percentage of the administrator's salary and benefits, business office services, and other related costs.
- The program makes a significant contribution to the college's community service mission, solidifies its relationship with an important business firm, establishes a track record of business collaboration that could lead to similar relationships with other industries, embellishes its reputation with local citizens, and enhances its placement services.

To the students:

- The program provides the opportunity to earn a respectable income for work related to their field of study.
- It offers on-the-job training and special utility training for which they receive college credit toward a degree.
- It introduces them to a major employer that periodically hires people trained in their specialty. (The utility has already hired five graduates. One graduate has been hired by another utility company.)
- It gives students the occasion to provide residents a public service by conducting a free audit and sharing low-interest loan information. The program exemplifies the best traditions of service learning, a means of developing a sense of community in the students.

To the community:

- The program offers home owners a free, professional service that can lead to lower energy expenditures and higher comfort levels.
- It contributes to the economic well-being of the community, releasing more discretionary income that can be used for other purposes.
- It produces a sense that there are caring agencies and organizations that are willing to share their skills with others—producing a stronger community spirit.

To the utility:

- The program allows the utility to reduce its energy analysis backlog by 324 per month over the term of the contract.
- It saved a significant amount of capital. The estimated average total cost of a home energy audit is $100 to $150. The utility paid the college $30 per audit. It also permitted the company to avoid hiring new fulltime employees to perform the work; it eliminated the need to place current employees on overtime; and it removed the possibility of contracting with a private organization whose charges might have been substantial.
- Customer evaluations of student/auditor performances have been excellent. The program has contributed to the company's reputation and has added significantly to its public image.
- It has made the company's investment in expensive auditing equipment (particularly the TI-765 computer terminals) more cost effective since it is in use seven days per week rather than the four days per week that fulltime employees work.
- The program has developed a ready, trained professional technician pool from which it can draw when new fulltime workers are needed, and it has personal knowledge of each individual's skills.
- The audits performed by company specialists and program participants through November 1, 1981, have saved the utility an estimated 6,350,977 kilowatt hours.

Problems

- Maintaining an adequate number of students to perform the required audits is a problem because:
  1. Some second-year students are already employed and attending evening courses to

upgrade their skills

2. Some students are themselves contractors, employees of contractors, or work for suppliers, so, to avoid any threat of conflict of interest, these student are disqualified, and
3. There are not as many students in the second year of the program as there were last year due to sequencing of courses.

- The special utility training required of the participants has to be repeated for the new students entering the program, and, when changes are made in utility policies, procedures, rates, and other areas, additional provisions have to be made to pass them along to the student auditors.

Future

Snohomish County Public Utility District Number 1 has budgeted $138,000 to support the program in 1982. The utility has 1,564 requests for home energy audits now, and it expects this level to persist in the foreseeable future. At this level, college program services will be required consistently.

The complete professional service contract is presented in Appendix B.

Brief Case Studies

Source D

Casper College
Associated Builders and Contractors, Inc.
Wyoming

Contact Persons

College
Paul Hartman, *Coordinator*
Construction Education
Casper College
125 College Drive
Casper, Wyoming 82601
(307) 268–2604

Business
Ken Kinner, *Executive Director*
Associated Builders and Contractors, Inc.
P.O. Box 4276
Casper, Wyoming 82604
(307) 265–3602

Program Description

Wyoming is an energy-rich state. In recent years, the college has worked directly with an assortment of energy-producing firms on education and training programs, particularly in coal and mineral mining. More recently, the college has established a cooperative program with Associated Builders and Contractors, Inc., to train construction foremen and superintendents in management techniques. The college provides facilities, instructors, and materials. With ABC's encouragement, private commercial and industrial construction firms in the state send selected employees to the courses. The firms pay tuition, student salaries during the training, subsistence (on some occasions), and materials expenses. The arrangement was initiated by ABC as the result of its previous exchange with the college's director of construction education. Because of the projected demand for trained managers in the industry and the expectation that the state's construction industry will continue to boom, this program is likely to continue for some time.

In preparation for this program, ABC sent the college's construction education director to a national management training program and paid all costs. In effect, the organization trained its own trainer. Following the model, ABC is now sending a second college instructor to a construction estimating seminar so that he might provide this kind of training through the college.

Prospects are strong that the college will also participate in another program currently being developed through ABC. Representatives of Indian tribes in the state have approached ABC to ask its help in training reservation residents in the construction trades. ABC expects to draw in the college as a training center for part of this program. Part of the present Indian construction trades training program (counseling and coordination) is supported by CETA funds. If CETA monies are not available in the future, tribal officials have indicated interest in supporting the program themselves.

Source D

Chattanooga State Technical Community College
Tennessee Valley Authority
Tennessee

Contact Persons

College

Don Stone, *Department Head*
Allied Health, Nuclear, Math, and Physics
Chattanooga State Technical Community College
Chattanooga, Tennessee 37406
(615) 622-6262

Business

Tony Arnold, *Training Supervisor*
Nuclear Operator Training Program
Sequoyah Power Operations
Training Center
Daisy, Tennessee 37319
(615) 8422-6583

Tennessee Valley Authority (TVA)
400 Commerce Avenue
Knoxville, Tennessee 37902
(615) 632-2101

Program Description

In the early 1970's, TVA completed an internal assessment of its nuclear power plant operator needs through the 1990's. One conclusion of this assessment was that TVA could not rely on outside sources to produce a trained manpower pool sufficient to meet company needs. Therefore, it committed itself to establish its own training facility. The training center was completed before 1976. In 1976 TVA contacted the college to provide blocks of related, non-credit academic courses to complement the technical training that was offered through its center. The college signed a formal professional services contract with TVA to provide courses in Chemistry, Math, and Physics. The college received a fixed rate for the hours, from which income the college instructors were paid.

In 1978 (partly triggered by the Three Mile Island incident), the college and TVA began talking about converting the program into a two-year degree curriculum. The degree program was initiated in February 1981 and, in addition to the previous courses it offered, the college provides instruction in thermodynamics, English, oral communications, technical report writing, and others. In this arrangement, TVA pays only the the tuition rate for each student in the program; other costs are covered through state funds provided the college on the standard fulltime-equivalency formula. All instruction is given at the TVA training center. The program currently enrolls some 160 students, who are trained specifically to work in one of the four existing nuclear plants operated by TVA.

Entering students are given the opportunity to join the International Brotherhood of Electrical Workers, an affiliate of AFL-CIO; most join. In the early discussions about the program needs, structure, and content, union and management officials worked out the program details. Later discussions to fine-tune the program were conducted by TVA instructors and college faculty. In every step of the students' certification process, examination boards assess individual student progress. The boards are composed of representatives of the union, management, and the TVA personnel office.

Source D

Colorado Mountain College
Union Oil Company
Colorado

Contact Persons

College
Gene Minor, *Professor*
Humanities Department
Colorado Mountain College
West Campus
Glenwood Springs, Colorado 81601
(303) 945-7481

Business
David Courtney, *Industrial Relations Director*
Union Oil Company
2777 Crossroads Boulevard
Grand Junction, Colorado 81501
(303) 243-0112

Program Description

The college is located in the center of significant energy resources, including coal, coke, molybdenum, uranium, and oil shale. In the last few years coal and coke production has increased, solar development has occurred in the area, and now the oil shale industry is under development.

In addition to a comprehensive transfer program on its three campuses and an extensive off-campus adult education program serving 27 rural communities, CMC offers several campus vocational programs.

A general industry program is offered in welding. In the 780-hour program, three daily shifts are operated for six-month periods. In the 220-hour pipe welding program, a shorter shift schedule is utilized.

Examples of service to the coal industry include a 530-hour mine maintenance management program through which employed miners are provided upgrading training in electricity, mechanics, welding, hydraulics, and an 80-hour mine supervisory program for upgrading communication and leadership skills.

The college also offers Solar Retrofit as part of the construction trades program. It is a 1600-hour classroom and on-the-job experience for those seeking employment or upgrading in the solar-related energy field.

With a few programs in oil shale technology underway and a recent federal grant for an oil shale chemical laboratory technician project, the college is preparing for major oil shale training.

In each of these cases, industry representatives work with the college to ensure program quality (instructors, materials, and students) and relevance.

In an effort to coordinate services to the mining industries, three postsecondary consortia have been developed. The college is a member of each. The consortia are: a tri-state (Colorado, Utah, and Wyoming) group interested in student and program exchanges, a seven-college consortia formed to articulate related programs offered at each institution, and the Northwestern Colorado Consortium for Training and Education (NCCTE). NCCTE is composed of Mesa College (four years), Northwestern Colorado Community College, and Colorado Mountain College. It is designed specifically to respond to oil shale production technican needs. NCCTE and the 27 mining firms in the area are presently discussing ways that the institutions might prepare technicians, including diesel mechanics, electricians, welders, miners, process operators, and instrumentation workers. The options include: building a new training facility, refitting an existing facility, and expanding programs already available at the colleges.

Source D

Delgado Community College
Energy-Producing (Natural Gas and Petroleum) Firms and Related Companies
Louisiana

Contact Persons

College
Edwin O'Neal, *Professor*
Petroleum Engineering Technology
Delgado Community College
New Orleans, Louisiana 70119
(504) 483–4014

Business
Assortment of energy-producing (Natural gas and petroleum) firms and related companies.

Program Description

Louisiana leads the nation in natural gas production and is fifth in petroleum production. The result of this influence is that many of the 9,000 parttime and fulltime students in the college will be (or are now) employed by these industries. The college's Engineering Technology Division produces an assortment of technicians for these industries. Most of the technician programs feature a number of cooperative exchanges between the industries and the college. Chief among these are: curriculum advisory committees monitor the programs; fulltime faculty members have had and continue to have close ties with the industries; adjunct faculty are employed fulltime by the industries; many of the students who are fulltime employees of the industries participate in the tuition reimbursement programs supported by the industries; the industries provide print materials and audiovisual aids, facilitate access to operating plants for student field trips, and, in some cases, provide annual cash grants to various departments (the drafting department, particularly) for equipment purchases. Equipment donations are generally impractical because of the size (and attendant housing difficulties) of the equipment. College faculty also serve as technical advisors to the industries. The college sponsors industry overview workshops (10 to 12 weeks long) for support staff employed by the firms with which it works.

The college training is aimed at providing students with broad skills and with problem-solving capacities. Specific training is offered by individual companies through a combination of formal and on-the-job training.

No formal agreements have been prepared for these relationships.

Source D

Modesto Junior College
Richard Heath and Associates
California

Contact Persons

College
E. William Wilson, *Instructor*
Sunrise Energy Center
Modesto Junior College
College Avenue
Modesto, California 95350
(209) 526–2164

Business
James O'Bannon
Richard Heath and Associates
1100 West Scott
Fresno, California 93711
(209) 226–5376

Program Description:

The college's Sunrise Energy Center is a community information resource that offers displays, literature, assessments of local products and services, and access to a computer to analyze home energy efficiency with recommendations for performance improvement. The Center also conducts a variety of courses, workshops, and seminars for the general public, other college staffs, private contractors, and other special groups. It has administered demonstration programs in energy conservation and solar applications with the aid of state and federal funding. In many of these activities the Center has worked directly with local and state business firms.

Recently the Center was subcontracted by a private consultant firm to write sections of the Residential Conservation Service training manual required by the Pacific Gas and Electric Utility. The private consultant firm was contracted by the utility to prepare a full set of materials and to establish a training facility. The college was subcontracted because of its proximity to the training center, its national reputation in conservation and alternative energy education, its experience in materials production, and its responsiveness. The college prepared materials on topics categorized under household conservation measures and passive solar water heaters. Because the materials were written in modular form, the college is able to use them in some of its own instructional programs.

To implement the program, the consultant firm hired two college instructors fulltime to help handle the initial training sessions at the new utility facility. In the early part of the program, utility employees who were selected to serve as subsequent trainers sat in on the sessions and later took over the full responsibility.

The college was paid a flat contract rate for its work.

Case Study Abstracts

Source A

College

Bay de Noc Community College
Escanaba, MI 49829
(906) 786–5802

Contact

Chuck Gold
Director of Contracting
with Business and Industry

For the past five years the college has administered a special career orientation, training, and personal development program called Contracting with Business and Industry. The program uses local businesses and industries as training laboratories through which students acquire job skills in a broad range of occupational areas. Professional business persons serve as college adjunct faculty in the on-location portion of the program. Related on-campus studies are arranged around appropriate occupational areas and a job seeking skills course is required. Job performance learning objectives are established for each student through mutual agreements between the college and the businesses. A formal contract is signed by each business stating its agreement to provide the instruction required to meet learning objectives. The business is paid for the instruction by the college. Performance evaluations are made by the college and the businesses. Fifty-four firms are currently participating in the program. Some of the occupational training available through the program are: quality control assistant, computer operator/programmer, industrial relations specialist, greenhouse operations, and systems analysis. Eighty-eight percent of the program students are placed either in full-time employment or related four-year college transfer programs.

Source A

College

Cedar Valley College
3030 North Dallas Avenue
Lancaster, TX 75134
(214) 746–4843

Contact

Cecil Brewer, *Associate Dean*
Technical and Occupational Programs
(214) 746–4790

The college is working with the Dallas New Car Dealers Association and the National Automobile Dealers Association in its Associate Degree program in Automotive Technology. Apprentices enrolled in the program work full-time with a member dealer and attend college two nights per week. For the three-year program, students receive 18 credit hours for their on-the-

job training, 33 credits in automotive theory, and 17 credits in related academic courses. Starting pay is $4.50 per hour, with increases awarded after successful individual progress reviews conducted every 500 hours of training. Program completers receive an associate degree in Automotive Technology, journeymen technician pay, and qualification to take all elements of the NIASE certification tests.

Source C

College	Contact
Central Piedmont Community College **P.O. Box 4009** **Charlotte, NC 28204** (704) 373–6566	Carl F. Squires, *Vice President* Career Programs (704) 373–6860

In calendar year 1980, the college conducted a special project (Project Upgrade) designed to identify current practices in the electrical/electronics industries in the area and to upgrade faculty information. Three electrical/ electronics instructors participated in the program to collect, compile, and distribute information they generated from the industries through a survey and through on-site visits. The instructors' teaching loads were reduced to one-third during the program's three phases. The phases were spread over three consecutive quarters. The instructors examined the current practices of 699 engineers, technicians, and support personnel in 16 different organizations. IBM/Charlotte funded the salaries of the temporary parttime electronics instructors employed to relieve the three program faculty. The instructors' reports were combined in a publication and distributed through the state's community college system. The college plans similar efforts in 15 additional occupational areas.

Source A

College	Contact
College of DuPage **22nd Street and Lambert Road** **Glen Ellyn, IL 60137** (312) 858–2800	Joan Bevelacqua, *Director* Business and Professonal Institute (312) 858–6870

The college's Business and Professional Institute is working with Firex Corporation, an expanding electronics firm, to train new employees. Eleven training sessions are planned: orientation, communications and decision-making, sales/sales management, customer relations and telephone procedures, safety, CRT, manufacturing technology orientation, basic electronics, soldering, supervisory, and welding. Four of the eleven seminars will be videotaped for company use with future employees. Along with the classroom training, the project will provide approximately six months on-the-job training for all new employees, and the Institute will supply training services to the firm for 12 months. The training will be conducted on campus, at the plant, or in a nearby hotel. Outside professionals and Firex staff will be used as instructors. The Institute's expenses will be paid by a grant from the state High Impact Training (HITS) program. Fifty percent of the employees' and on-the-job trainers' salaries will be covered by an Industrial Training Program (ITP) grant. Both HITS and ITP are economic development grant programs administered by the state Department of Commerce and Community Affairs. The college's Business and Professional Institute was created specifically to address business and industry needs. Since its inception in September 1976, the Institute has signed160 contracts with area businesses.

Source C

College	Contact
Columbia Basin College **2600 North 20th Avenue** **Pasco, WA 99301** (509) 547–0511	William Evans, *Associate Dean* Occupational Education (509) 547–0511, ext. 205

Through its Nuclear Technology Program, the college is working with a number of contractors associated with the construction and operation of three nuclear power plants that are part of Washington Public Power Supply System's (a public utility) Hanford power generation complex. Among some of the contractors involved are: Westinghouse, Exxon, and Rockwell International companies. Each of these companies, and others, participate on the college's advisory committee to the Nuclear Technology program. They played an important role when the program was initiated in 1975–76 by assisting with curriculum development, loaning and/or donating equipment, providing materials and supplies, generating public information about the program, helping apply successfully for a federal grant to support the program, and recommending a highly competent instructor. They continue to be active in the program, providing, among other services, access for students to classified nuclear facilities under construction or in operation. The college's program trains students for entry level jobs in the industry. The college also offers special training programs for industry employees.

Source A

College	Contact
Diablo Valley College **Pleasant Hill, CA 94523** (415) 685–1230	William P. Niland, *President* Diablo Valley College R.J. Hendrickson, *President* Diablo Valley Enterprises (415) 687–8373

Diablo Valley Enterprises is a non-profit corporation created in 1979 by Diablo Valley College faculty and local industry representatives in cooperation with the Lawrence Livermore National Laboratory (operated by the University of California for the U.S. Department of Energy). The company manufactures a briefcase computer, which is a special training tool for micro-computer instruction and experimentation. More than 110 two-year colleges have purchased the computer and the college's own electronics laboratory is stocked with several units donated by the corporation. All corporation employees are college students in the Electronics Technology program. The student/employees work as unit assemblers, gain hands-on experience related to their studies, and receive wages for their work. Students are also assigned to various management positions in the corporation. The corporation's president was formerly the college's Electronics Technology department chairman, and the chairman of the corporation's board of directors is an official with Plantronics/Zehntel, a printed circuit board test equipment manufacturing firm. The board of directors is composed equally of business executives and college officials.

Source A

College	Contact
Dundalk Community College **7200 Sollers Point Road** **Dundalk, MD 21222**	John E. Ravekes, *President* (301) 282–6700

The college is working directly with Bethlehem Steel/Sparrows Point facility through three different approaches: existing college courses open to industry employees, specially prepared courses to meet industry training needs, and special, longer-term programs to train technicians for the industry and for other related industries. By the end of this academic year, the college expects to have approval for a new regional AA degree program in Electric Maintenance Technology. Graduates from such a program are needed by Bethlehem Steel, Armco Steel, General Motors, Westinghouse and other local industries. The college is also preparing to introduce a similar program for Millwrights/Industrial Machinists.

Source A

College	Contact
Eastern New Mexico University **Roswell** **Roswell, NM 88201** (505) 347–5441	Loyd R. Hughes *Provost*

In 1975 the college initiated its AAS Oilfield Training Program after conducting an extensive needs assessment of the industry. Presently 442 students are enrolled in the program; more than 700 students are anticipated next year. Oil and natural gas firms provide equipment, training materials, and contributions for building construction; the state legislature provides support for personnel, supplies, and basic equipment; and the program advisory committee, composed mainly of industry representatives, provides guidance and assistance in generating additional funds, securing needed equipment, and ensuring that the program is attuned to industry needs. Ninety-three percent of the program graduates are employed in the oil and natural gas industry. The college has established the Oilfield Training Center Foundation to facilitate industry contributions to the program. ARCO has contributed $300,000 for the building program, and, recently, the Foundation funded the purchase of two new 40-passenger buses at a total cost of $44,000. All 18 faculty members are ex-oilfield hands. An industry executive, on loan to the college, assists in program management.

Source B

College	Contact
Fairmont State College **Fairmont, WV 26554** (304) 367–4191	Cartene L. Grucott *Associate Professor of Commerce* (304) 367–4261

Fairmont State College, in cooperation with Monongahela Power Company, provides data processing students the opportunity to gain practical programming experience. Since the fall of 1980, the college has selected student candidates for job placement and the firm has placed the interns. Qualified students earn college credits and are paid for their work.

Source C

College	Contact
Greenville Technical College **P.O. Box 5616** **Greenville, SC 29696** (803) 242–3170	Marty Jenson, *Director* Technical Scholarship Program (803) 242–3170, ext. 454

In the fall of 1979 the college, in cooperation with local industries, designed a program to train and provide scholarships for specially selected students. Each participating company agreed to support a specific number of students for particular skills instruction. This year approximately 22 companies are participating in the program; 92 students are enrolled. When prospective students apply for the positions, their applications are reviewed by the Technical Scholarship staff; applicants are then interviewed by the participating industries. Successful applicants are given scholarships by the companies; the scholarships are valued at approximately $15,000 per student for the three-year training program, covering tuition, fees, books, and wages earned on the job. Nine program options are offered, including business, chemistry, engineering technology, and textile management. Three or four courses are offered each quarter; students spend 20 hours per week on campus, and 20 hours per week on the job. Some classes are presented only for the scholarship groups; they are generally taught by company officials. Companies participating in the program include: General Electric, Union Carbide, American Hoechst, J.P. Stevens, 3M, and WSBC (a local radio station). The program was initiated by industry through the Chamber of Commerce.

Source A

College	Contact
Hudson Valley Community College **Vandenburgh Avenue** **Troy, NY 12180** (518) 283–1100	Dominick M. Eannello *Vice President for Planning and Public Service*

Through its Public and Community Service Project, a training component of the Community Services Division, the college is fulfilling the on-the-job training needs of local government and private industry. The general services of the Project are needs assessments, curriculum design, material development, and teaching expertise to upgrade the employment skills of the local constituency. Since its inception in 1979, the Project has provided a number of services including communications, data processing, basic mathematics, secretarial skills, and management courses for state government staff. The Project has coordinated training activities with General Electric and Fairchild Industries. It will soon develop a Utilities Apprentice Training Program for the New York State Office of General Services. The three-year program will focus on five major instructional areas: air conditioning, electricity, steam plant, mathematics, and English.

Source A

College	Contact
Lakeshore Technical Institute **1290 North Avenue** **Cleveland, WI 53015** (414) 693–8211	Richard Romaine *Public Information Specialist* Steven Smith *Trade and Industry* *Economic Development Coordinator*

Since the spring of 1980, the college has been working with Kohler Company to assist in the firm's Factory Service Schools. The Schools provide four-and-one-half day intensive training for distributor and dealer personnel involved in Kohler engine maintenance, repair, and sales. Participants come from across the United States, Canada, and England. Nine sessions have been scheduled for the 1981–82 academic year on the college campus. Theory classes are presented in the college Conference Center and practicums are given in the college's Motorcycle, Marine, and Small Engine Mechanic program laboratory. Kohler Company service specialists are assisted in the instruction by two college faculty from the Trade and Industry Division.

Source: Contact with Mobil Corporation, NY

College	Contact
Lamar University **Beaumont, TX 77710** (713) 838–7011	Kenneth Shipper Vocational Education Vicky Price ESP

The University is working with Mobil Oil Company, Houston, on a two-part program to train young Saudi Arabians in petroleum production. The university is offering English for Special Purposes (ESP) and vocational/technical programs. For the ESP program the university has subcontracted with a private firm to provide students instruction in job-specific language. The instruction is presented on campus under the supervison of university officials. The six-month vocational/technical program is designed to provide students with a general science and technical background. The instruction is offered by the university staff. Mobil provides total support for both program parts.

Source C

College	Contact
Lorain County Community College **1005 North Abbe Road** **Elyria, OH 44035** (216) 365–4191	Carl J. Filipiak, *Coordinator* Apprentice Training

Since 1970 the college has been working with Lorain-Cuyahoga Works of the United States Steel Company to train apprentices in the electrical, machinist, millwright, mobile equipment repair, and refractory masonry crafts. Students are divided into two groups; they spend four weeks at the plant for hands-on experience and then four weeks on campus. Instruction is given by part-time faculty, most of whom are retired U.S. Steel supervisors, retired or practicing journeymen, and retired teachers who are specialists. Tools, equipment, training aids, films,

videotapes, and equipment related to the five craft areas are provided by the firm. Also, the company provides substitute instructors or instructors for specialized topics. At present, there are 6 groups of students (20 in a group) in the electrical program, 3 groups in the millwrights, and 17 students in the machinists program. Other agreements administered by the college include millwright and machinist training programs for Cleveland Electrical Company.

Source A

College

Macomb County Community College
14500 Twelve Mile Road
Warren, MI 48093
(313) 445–7000

Contact

Edward Lynch
Dean of Technical Education

The college is one of 39 community colleges that have signed an agreement with General Motors to provide automotive service training. Eventually 60 colleges are expected to participate in the program. The national effort is designed to expand the use of the 31 GM training centers, to train twice as many technicians as GM can produce itself, and to provide training closer to dealerships. Program strategies include: earlier model training provided by colleges, new model training offered at existing GM centers, selected courses presented by GM instructors at the colleges, evening and Saturday courses offered at some of the colleges. The need for additional higher-skilled technicians has been created by new GM products and advanced technology. A related program called Automotive Service Education Program (ASEP) was initiated two years ago at Delta College, Michigan. Sponsored by GM dealers, 12 students graduated from the program with associate degrees in automotive technology. Brookhaven College (near Dallas, TX) is currently offering the program and one has opened at Triton College outside Chicago. The ASEP program includes pre-training for college instructors at GM centers, provision of GM components, and donation of essential training materials.

Source A

College

Manchester Community College
Manchester, CT 06040
(203) 646–4900

Contact

Charles A. Plese
Director of College and Community Relations
(203) 649–9691

In 1975 Pratt & Whitney Aircraft Group (a division of United Technologies), one of the largest jet engine manufacturers in the U.S., approached the college to help resolve some of the problems related to the firm's long-standing apprenticeship programs. The programs are electronics, sheetmetal, and machine operations. The result was that the college agreed to award 30 academic credits for each of the apprenticeship programs and develop 13 new courses to create a new set of curricula. Currently, 10 credit courses and 16 sections are provided each semester to both shop and office personnel. Over 225 apprentices have graduated from the combined program. Noncredit preparatory classes are also offered. Eastern Connecticut State College now participates in the program to allow students to go on to a four-year degree if they choose. The company pays a flat rate to the college and students pay, through payroll deduction, a nominal amount to the employer. Instruction (and support services) is offered at the company facility before and after work shifts.

Source B

College	Contact
Mayland Technical College **P.O. Box 547** **Spruce Pine, NC 28777** (704) 765–7351	Fred L. Stout *Director of Vocational Studies* (704) 765–7351, ext. 55

The college is working with the Tennessee Valley Authority to evaluate the performance of solar water heating systems in the TVA region. The college has designed and is installing a solar water heating system that will meet part of its hot water requirement. TVA has supplied monitoring equipment and funding for the installation of this equipment. The college will be reimbursed for required monitoring equipment not provided by TVA. TVA will offer the college technical advice and assitance. Under the agreement, the college will permit TVA to conduct tours of the system. Monitoring equipment furnished by TVA will be removed at the end of the project. The agreement is for three years.

Sources B & C

College	Contact
Miles Community College **2715 Dickenson** **Miles City, MT 59301** (406) 232–3031	Robert Hokom *Dean of Instruction*

A Power Plant Technology Program was established by the college and Montana Power Company in response to the utility's concern about the drop in the number of employees trained to staff coal-fired electrical generation units within one service area. Instruction is offered to company employees at the Colstrip and Billings plant sites. The college evaluates and approves courses and company instructors, coordinates program and curriculum development, provides complementary academic courses, and records credits earned. The firm pays for all instruction and materials, advises the college on program and curriculum development, provides classroom space and access to the plants, and coordinates the program with the local union (I.B.E.W. #44). All instructors are company journeymen/supervisors.

Source B

College	Contact
Mountain Empire Community College **P.O. Box Drawer 700** **Big Stone Gap, VA 24219** (703) 523–2400	Michael S. Hensley *Dean of Instruction* (703) 523–2400, ext. 202, 203

A grant from the Westmoreland Coal Company and the Penn-Virginia Resources Company enabled the college to offer local public school teachers a course titled "Man in His Environment." The purpose of the course was to make teachers more aware of environmental problems and conservation issues and to encourage coverage of these topics at every grade level. Topics included: water and air pollution, forest and agricultural ecology, recreation and wildlife,

ecology, energy and the environment, and the preparation and presentation of these materials. The course was offered during the summer for six semester hours and was approved by the State Department of Education and the local superintendents for certificate renewal. The college coordinated, administered, and provided the instruction, equipment, and facilities for the course. Tuition, fees, supplies, materials, daily refreshments, field trips and a final banquet were paid by the firms. The firms also provided vehicles for field trips and consultants and speakers to help with instruction. Experts from business, industry, and government served as consultants and visiting lecturers.

Source A

College	Contact
Mountain View College **4849 West Illinois Avenue** **Dallas, TX 75211** (214) 746–4200	William Jordan *President*

The college has contracted with Braniff Educational Systems, a proprietary institution, to train aircraft and power plant mechanics to satisfy the projected demand for mechanics in the Dallas area, one of the important aviation centers in the country. Currently, more than 250 students are being trained in this two-year associate degree program. All training is conducted by Braniff Educational Systems under direct supervision of the college. The training is offered at Systems' training center. Because of the success of this program, the college is exploring with other proprietary schools possible contractual arrangements in Machine Shop training.

The college is also working with a wide assortment of other industries in the area, providing training at the firms with flexible scheduling options. Key elements of these efforts include: use of industry equipment and facilities, use of industry personnel as instructors, and industry support of training costs.

Source A

College	Contact
North Dakota State School of Science **Wahpeton, ND 58075** (701) 671–2221	John Larsen Mobile Training Program

In 1980 the college initiated a Mobile Training Program to serve the training needs of state businesses, industries, and other education institutions. Through the use of specially-fitted semi-trailers, the college is able to bring the classroom, laboratory, and technical equipment and tools to disperse locations quickly. Available programs include: auto mechanics, building operation and maintenance, carpenter helper, diesel mechanics, weatherization technician, welding construction, welding production, and welding repair. Recently, the college worked with a western North Dakota manufacturer to convert its welding operation from stick electrode to M.I.G. wire feed welding. The eight-week program was taught by a regular college instructor. Sixty employees of the firm participated.

Source A

College	Contact
Northland Pioneer College **1200 East Hermosa Drive** **Holbrook, AZ 86025** (602) 524–6111	Arvin Palmer *Dean of Instruction*

Among a number of cooperative programs, the college is working with the Salt River Project, a coal-fired electric generating plant. The college contacted the Project in 1979 to evaluate the plant's in-house training program relative to the college's requirements and curricula. The result was that the plant courses were altered to meet academic requirements, academic and general education courses were added, and a specialized AAS degree program in Power Plant Operator Technology was created. The technical courses are offered at the plant; the instructors are Project employees. Students are given release time from their jobs to attend. The college reimburses the plant for instructors on a course by course basis. The first program class graduated in May 1981. Tuscon Electric is building a new power plant, some of the trained workforce for which will come from the Salt River Project program. For this new plant, the college is working with Brown and Root Construction Company to train an assortment of construction craftsmen, including welders, concrete workers, pipefitters, carpenters, and blueprint readers. Company journeymen are hired by the college for this training, too.

Source A

College	Contact
North Shore Community College **Three Essex Street** **Beverly, MA 01915** (617) 927–4850	Roberta Stoller Division of Continuing Education

Over the past few years the college has had cooperative agreements with local industries involving training in machinist trades, blueprint reading, electronics, and pre-retirement activities. Most recently, the college administered a Machine Operators Training Program in concert with 12 small, local machine shop owners, and a nearby vocational school. Twenty-two students participated in the 25-hours per week, 15-week program; upon graduation, each was employed by one of the 12 machine shops. Instruction was provided by the college on equipment made available by the vocational school. The Bay State Skills Commission matched funds solicited from the 12 shop owners to support the program.

Sources A & B

College	Contact
Oakland Community College **Auburn Hills Campus** **2900 Featherstone Road** **Auburn Heights, MI 48057** (313) 852–1000	Debra Rowe, *Instructor* Alternate Energy Program (313) 852–1000, ext. 309 Marion Rice *Provost*

The college's Alternate Energy Program has worked with three local solar energy companies to organize workshops on solar energy. The companies contributed free professional speakers and provided displays to advertise the workshops in local banks. The college is also cooperating

with Upland Hills Ecological Awareness Center to meet their mutual goal of energy conservation and renewable energy resources education. The Center has opened its facility to the college for class tours; the facility includes a solar awareness area, two wind generators and a solar heated geodesic dome. In return, an instructor from the college offers workshops for the Center. The Energy Management course at the college is taught by personnel from Equifax, a company that trains energy auditors for Detroit Edison's Residential Conservation Service program. Equifax uses its own curriculum and materials for the course.

Other programs through which the college is cooperating with businesses include: Robotics Technology (with General Motors); electrical and climate control technology (with U.S. Army Reserve School); and auto claims insurance adjusters training (with American Automobile Association).

Source B

College	Contact
Oakton Community College **1600 E. Golf Road** **Des Plaines, IL 60016** (312) 635–1600	Leslie W. MacDonald, *Director* Educational Services for Business, Industry & Government (312) 635–1654

On September 24 and 25, 1981, the Heating and Air Conditioning Technology program at Oakton Community College offered a workshop to demonstrate steam energy conservation methods and equipment to 30 local engineers. The workshop emphasized the installation, maintenance, operating, and energy characteristics of all types of traps and steam handling components. Armstrong Machine Works of Three Rivers, Michigan, provided four guest speakers, a tour of their plant, and free lunch for workshop participants. The firm produces steam traps, industrial steam humidification, and type strainers. The college coordinator of the Heating and Air Conditioning Technology program developed the workshop curriculum and made contacts with the firm. The college printed notices and sent them to 500 engineers, handled registration, and bus and dinner arrangements.

During the week of April 19, 1982, the college will host a meeting of the American Society of Heating and Refrigeration Engineers.

Source A

College	Contact
Odessa College **P.O. Box 3752** **Odessa, TX 79760** (915) 337–5381	Gayle Noll *Director of Informational Services*

In the spring of 1981, the college established its ACTION project, a means of providing two-way communications between the college and the local business community. The stimulus for the project was an oil boom in the Permian Basin created by the national interest in producing more domestic fuels. The boom is responsible for serious skilled manpower shortages in the area. One result of the dialogues generated by the ACTION project is state-level approval for a new college associate degree program in oil and gas technology to be offered in the spring of 1982. The college has also started a two-year program in maintenance engineering. In cooperation with the Permian Basin chapter of Associated Builders and Contractors (ABC), the college is offering a basic electricity class and hopes to develop other non-credit, specialized classes for ABC employees. The college's adult basic education department has developed a program to help train Spanish-speaking oil field workers.

Source A

College	Contact
Paris Junior College **Paris, TX 75460** (214) 785–7661	Harley Davis *Dean of Applied Sciences*

For the past three years, the college has provided in-plant and on-campus training for personnel in the Fossil Power Generating Division of Babcox and Wilcox Corporation. Two courses offered are Industrial Safety for Supervisors and Hydraulic Maintenance. In concert with the firm, the college is developing two additional programs to assist the company in complying with OSHA Noise Standards training requirements. Also in the development stage is a quality circles program. The college will provide training for the circle leaders and for participants in each circle. In preparation for the circles program, college instructional staff attended a company training seminar to facilitate program development and to shape it to meet specific company needs. The college has also produced 14 videotapes for the company – an effort in which the Texas Education Agency assisted. The tapes provide orientation for prospective employees, orientation for current employees on various job classifications, and general training.

Source*

College	Contact
Rend Lake College **Ina, IL 62846** (618) 437–5321	Ron Sanderson, *Chairman* Mining Department

The college is working directly with Inland Steel Coal Company and Old Ben Coal Company to train coal miners for the expanding coal industry in the area. The college's Mining Technology program opened in 1974 with a class of seven students; with industry expansion and assistance, the program now involves approximately one-third of the 5,000 students at the college. The program includes a two-year associate degree and special courses on mine safety and health required by state and federal regulations. Mining technology advances have increased the need for well-trained mechanics, other technicians, and supervisors beyond those that the industry is able to provide itself. The college has designed a curriculum for the industry and works with the firms to ensure its currency. Inland Steel Coal Company has also established an intensive nine-month scholarship program with the college to train potential employees in equipment maintenance mechanics.

*from an article in *Illinois Economic Progress through Community Colleges*, January 1982.

Source A

College	Contact
Robeson Technical College **Drawer A** **Lumberton, NC 28358** (919) 738–7101	Wayne Newnam *Marketing Director*

For 14 years the college has been working with Acme Electric Corporation, a leader in power conversion products. Before a plant was constructed, college officials, state and local

government administrators, and company representatives met to evaluate the feasibility of locating a plant in Robeson County. The plant was opened in 1968. Over the years, the college has offered courses for company employees in safety, welding, management, electronics, maintenance, electrical techniques, machine set-up operations, and other fields. A total of 99,112 course hours have been presented. Many plant personnel attend evening classes at the college to keep up with new technology. The plant manager serves on the college's curriculum advisory committee. The company has donated many pieces of electrical equipment that are used as teaching aids and it participates in graduation exercises by presenting awards to outstanding students in Electrical, Air Conditioning, and Electronic programs.

Source A

College	Contact
State Fair Community College **1900 Clarendon Road** **Sedalia, MO 65301** (816) 826-7100	Marvin Fielding *Vice President*

In concert with the needs of local industry, the college Media Center has produced an assortment of videotape programs matched to specific company needs. The companies establish their own program objectives and prepare scripts; the college consults on the scripts and handles the technical aspects of production. The presentations are used in training given by company supervisors, for individualized instruction in the plants, in short-term training sessions conducted by college instructors in the plant, and for individualized or group instruction in the college's Learning Resources Center. Local industries contribute script writers and part of the development costs; the Missouri Department of Elementary and Secondary Education, Industrial Education Division, funds most of the work. The industries using the college-produced materials report that over 1,200 employees were trained during 1981.

Source A

College	Contact
Triton College **2000 Fifth Avenue** **River Grove, IL 60171** (312) 456-0300	Brent Knight *President*

The college is one of 39 throughout the country working with General Motors to provide automotive service training. (See Macomb County Community College entry for description.) In cooperation with the Society of Die Casting Engineers, the college is completing construction of a 7,500 square foot facility at its River Grove campus to house the international training center for the Society. It will contain approximately $300,000 worth of training equipment, most of it donated by private industry. The Society will rent the building, helping to defray the cost of construction. The training programs will be designed for entry level persons and for already employed technicians who wish to upgrade their skills. An associate of applied science degree will also be offered.

Source C

College	Contact
Utah Technical College at Provo/Orem **1395 N. 150 East** **Provo, UT 84601** (801) 226–5000	Carl Crawford *Instructor* Linesman Training Center

The college has established a Linesman Training Center to prepare students for employment in the power industries in the region and to offer upgrading for employees. The center was established in cooperation with the Intermountain Power Superintendents Association. It was viewed as a means of ensuring better cooperation among the various power suppliers in case of power and materials shortages. The college received a critical-industries state grant to initiate the Center; the grant paid instructors' salaries and permitted the purchase of supplies. The utilities have donated equipment for the program. Since January 1980, the college has offered an associate degree program in linesmen training. In cooperation with local utilities, apprenticeships are offered to second year students. Presently, 25 fulltime students are enrolled in the program; 32 are enrolled in the evening, upgrading curriculum.

State Economic Development Model

North Carolina has created a comprehensive economic development model that addresses all of the issues highlighted in this paper. Central elements of the model are presented below.

In 1981, the governor designated the community colleges as "the presumptive deliverer of skilled training" and termed the colleges ". . . the backbone of our economy in this state." He said, "The most frequently mentioned reason given by industries for locating in our state is the availability of job training in any location in North Carolina."

Stimulated by this position and by earlier support, the State Department of Community Colleges has established a new and expanding industry program specializing in the provision of customized training for industry. The Department has created close associations with local and state offices of the Industrial Developers Association, the Department of Commerce, Chambers of Commerce, and other industrial groups.

In 1980, the Department of Commerce's Industry Services Division joined with the Department of Community Colleges in housing staff in seven regional field offices across the state in an effort to work more closely with the private sector.

In 1979–80, 41 of the state's 58 community and technical colleges provided specialized training for 95 new and expanding industries, trained more than 7,000 employees, and were supported in this effort with over $1.8 million of state funds set aside for these purposes.

Two-thirds of the training for new and expanding industries is in metals, metal fabrication, electronics, and other types of industries new to the state.

State law requires that the Department of Community Colleges "shall assist with the pre-employment and in-service training of employees in industry, business, agriculture, health occupations, and governmental agencies." Part of the Department's response to this charge was its preparation of regulations on in-plant skill training. As a result, the quality of industry-specific training is consistent with on-campus courses. The in-plant programs are reviewed regularly by Department auditors.

The Department also has an educational/industrial leave with pay program that helps keep instructors current with present technology and industrial development. The state provides funds to local institutions to pay salaries of professional personnel for up to 60 work days a year for staff development. Eligibility requirements include: employment for three years or more for nine or more months per year, with a contract to return to the institution following the industrial leave. Some of these leaves are used to place instructors in industry.

In 1981 the state legislature provided $5 million for new training equipment. More support for this purpose is expected in subsequent years. Also, it has approved pre-funding for state

priority programs, allocating $2.1 million for starting specially-funded programs aimed at hard-to-fill positions, like electronics engineering technology, machinist, industrial maintenance, instrumentation technology, and computer programming. The $2.1 million was also targeted for the establishment of Cooperative Skills Training Centers. Eight Centers were funded in 1981–82 and seven more will be created in 1982–83. The Centers are designed to prompt even closer working relationships with local industry. Funds have also been earmarked to support classes of related supplemental instruction in apprenticeship programs.

Student fees for those enrolled in new and expanding industry training and for all persons enrolled in Adult Basic Education and Adult High School and GED programs are waived.

In 1980, 18 companies in the greater Raleigh area contributed a total of $50,000 to create a manpower resource development program with the Greater Raleigh Chamber of Commerce. Among the activities of this group was the production of a handbook targeted at youth in the area, containing company descriptions, number of employees for each, location, contact person, and job opportunities in each of the firms. It also provides occupational profiles. The three community and technical colleges in the region with private and public schools helped in the development of this program through the involvement of their directors of guidance and counseling. The group has also published a directory of training resources in the area.[33]

As part of its overall effort, the Department of Community Colleges has developed energy curriculum packages for use in the colleges.

Analysis of Cooperative Agreements with Conclusion

Analysis of Cooperative Agreements

This section identifies some of the special characteristics of cooperative agreements as they are applied in two-year colleges. It highlights their variety, benefits and problems associated with their implementation, advice offered by college officials who have had experience with them, and some issues raised by them that colleges should examine.

Models Variety

As the models presented in the previous section clearly indicate, the variety of college efforts is nearly limitless. Capsules of the arrangements are outlined below:

- A full-fledged, state program mandated by the state legislature and endorsed by the state's administrator. (North Carolina)
- A regional consortium of colleges working with an association of firms involved in one energy area. (Colorado Mountain College)
- Special service unit established within the college to respond directly to industry needs. (College of DuPage, Illinois)
- A college collaborating with an international trade association. (Triton Community College, Illinois)
- A college working with an international petroleum firm to train foreign students. (Lamar University, Texas)
- A college working as part of a national network to extend the training capacity of a large firm. (Macomb County Community College, Michigan)
- A college cooperating with the state chapter of a national organization to facilitate agreements with state firms that are members of the organization. (Casper College, Wyoming)
- A college working directly with a collection of related industries on a national scale. (Eastern New Mexico University – Roswell)
- A college administering agreements with a variety of industries in the local area. (State Fair Community College, Missouri)
- A college working with a single agency to provide supplemental academic courses for a technical training program conducted by the agency. (Chattanooga State Technical

Community College, Tennessee)

- A college working with a private consultant firm to produce training materials for a utility. (Modesto College, California)
- A college operating state-wide mobile training labs. (North Dakota State School of Science)
- A special program office established at the college to administer a unique industry project. (Bay de Noc Community College, Michigan)

The models also suggest that no single access point in the colleges is more optimal than another for businesses interested in working jointly with institutions. The models show that programs are operated through various offices. Some agreements are administered by special divisions organized to seek out and respond to industry needs; some are managed through Community Services Divisions; others are directed through Occupational Education Departments. The richest areas for the initiation of these agreements appear to be the management structures of the colleges. These structures include the colleges' Boards of Trustees and the advisory committees that give counsel to occupational programs. Opportunities for business persons to serve as adjunct faculty for the colleges offer another avenue to stimulate agreements. Each of these possibilities offers ways for business to influence programs offered at colleges and to learn about the quality of programs and students.

The models indicate that the colleges have made a point of introducing themselves to local businesses and to officials in local branch offices of national trade and business associations. These introductions are especially important for community colleges, since many business people know little about the purposes, interests, and capacities of the colleges. For the most part, their experiences with postsecondary education have been with the baccalaureate colleges and with universities. The images they harbor of community colleges may be inaccurate and uncomplimentary. It is the colleges' responsibility to replace inaccurate images with correct ones and to let business know precisely what the colleges are willing and able to share with them.

These models do not represent the full scope of college relationships with industry. Rather, they are selected models that suggest the richness of these agreements. Also, the capsules above indicate only one way a college works with industry; they do not capture the full extent of a single college's activities. In fact, many colleges have established a number of different programs and they administer these programs in different ways. College and industry relationships are multiple, even in a single college.

Benefits, Problems, and Advice

In addition to program descriptions, the AACJC Energy Communications Center survey asked colleges to identify major benefits of cooperative agreements for the institution, the industry, and the community. Also, they were requested to describe the problems the institution, industry, and community experienced because of the program(s) and to offer advice to other institutions regarding such relationships.

A summary of their responses is given below along with related details collected from other literature.

Benefits to the College

- Provides hands-on experience for students
- Enhances job opportunities
- Assists college fulfill its responsibilities for human resource development
- Brings in revenue

- Generates linkages between business, labor unions, professional groups, and other institutions that make future collaboration more likely
- Opens access to up-to-date equipment and materials colleges couldn't purchase or produce themselves
- Heightens community recognition of the college as an important resource for expert, low-cost technical assistance for citizens and for organizations
- Helps faculty to keep current with state-of-the-art technology

Benefits to Industry

- Provides expert, flexible, low-cost training and services for employees
- Produces entry-level persons with appropriate work skills and a professional attitude
- Creates good public relations by working directly with community organizations and by helping to respond to community development issues
- Establishes a pattern of cooperation that may be used in the future
- Produces tax advantages
- Permits participation in the structuring of training programs to ensure that they are shaped to their specific needs
- Identifies college experts who could help construct company training programs
- Establishes a ready pool of trained manpower
- Creates confidence that company redirections will be followed in tandem by college shifts in programming
- Builds adaptable, trained technicians capable of assuming some of the responsibilities of professional-level employees, thus reducing the need for large numbers of additional high-salary employees and diminishing payroll costs
- Reduces the need for expanding in-house training programs
- Provides trained technicians for firms too small to train their own workforce
- Helps to stabilize labor union membership, relieves pressure on unions created by the introduction of a new major facility, and expands membership access to secondary and postsecondary institutions.

Benefits to the Community

- Controls/reduces in-migration of people to serve the manpower needs of new and expanding industry
- Establishes a reliable, respectable, easily accessible learning center through which residents can gain new skills and upgrade their present capacities, thereby enhancing their long-term employability
- Locates a community center through which objective, reliable information about jobs, skills requirements and benefits, conservation products, and general energy-related information can be obtained
- Offers expert, low-cost or no-cost services (audits, for example) provided by students employed in experiential learning situations
- Stengthens the community's capacity to hold existing industries and attract new ones

Problems for the College

- Enlistment of sufficient numbers of high caliber students for on-the-job work assignments that require a specific number of hours in the workplace
- Identification of the company official responsible for program liaison
- Funding limitations
- Reduced public interest in the program (alcohol fuels)
- Delays in equipment acquisition and installation
- Inadequate laboratory/training space to accommodate massive equipment (nuclear, petroleum, and coal particularly) for on-campus, hands-on experience

Problems for Industry

- Delays in filling available internship/on-the-job/experiential learning positions arranged with the college
- Failure to understand college processes required to establish and operate new programs
- Program coordination between training offered at two plant locations
- Interruptions in production caused by college field trips
- Confusion over record keeping responsibilities and the required scope of the records
- Flux in the price of gasoline and corn (for alcohol fuel production) that affect profitability

No problems were reported for the community.

Advice for the Colleges

- For internship/on-the-job/experiential learning programs, screen all candidates carefully for their potential, interest, and availability.
- Avoid implementing a strictly on-campus technical training program because of the: (a) paucity of qualified instructors; (b) expense of qualified instructors and the turmoil the differential between their salaries and those of other faculty might cause; (c) turnover of qualified instructors as a result of the higher wages industry is willing to pay for them.
- Contact local labor union officials to communicate interests and capacities, to determine the labor/management environment, and to pursue potential training areas.
- Carefully analyze the number of trained manpower the industry is likely to require before embarking on a full-fledged program.
- Persist in "selling" a program to industry; what does not fly today may be attractive later.
- Plan in detail. Delineate the specific responsibilities of each party in the agreement, identify the liaison persons(s) for each group, establish time lines for task completion, create evaluation mechanisms, state other program expectations, and structure follow-up procedures.
- Clearly identify, discuss, and resolve all problems as they occur.

- Involve appropriate faculty from the initial stages.
- Allow adequate time for the college department responsible for the program to establish contacts and to clarify all agreement points.
- Clearly define the advantages/liabilities/possible problems for the college, business, and the community at the program's inception.
- Establish an active program advisory committee representative of the industry and the college that is willing to donate the necessary time.
- Consult with other colleges that have implemented similar programs to share experiences, arrange cooperative programs, and standardize (to a sensible degree) training content.
- View industry as a full partner in deliberations, not as an outsider.
- Control program quality so that what is offered for industry is consistent with the quality of on-campus programs.
- Let business know what you can do and accept only those tasks that you can do best.
- Demonstrate the cost effectiveness of the services you provide.
- Focus on those activities that only you can provide—a sole-source arrangement.
- Concentrate on smaller firms because they are most in need of assistance and to help guarantee that program liaison is with the firm's top official.
- Use the college's constituency and community organizations that are supportive to establish relationships, and, once established, to assure successful completions.
- Use already available training materials and equipment to avoid unnecessary costs, to help tailor programs to industry needs, and to provide the most current learning experiences for students.
- Produce materials that can be adapted for on-campus programs for other students.
- Be adaptable, quick, and responsive to industry needs.
- Adhere closely to agreed time lines.
- Avoid being territorial; that is, invite other related groups or individuals to share in the work.
- Learn how the business operates so that administrative problems can be avoided.
- Be sensitive to the firm's political structure and use it to secure the program's success.

Considerations

There are compelling reasons colleges and business should work together even more fully than they have in the past. The union of these two distinctive groups, however, should be consummated with care.

1. In their intensified search for program support and for ways to assist local business improve productivity and profitability as well as to contribute to community economic development, colleges should not lose sight of their essential purpose. Boyer and Hechinger characterize the purpose in the following way:

> The aim [of education] is not *only* to prepare the young for productive careers, but to enable them to live lives of dignity and purpose; not *only* to generate new knowledge, but to

> channel that knowledge to humane ends; not *merely* to increase participation at the polls, but to help shape a citizenry that can weigh decisions wisely and more effectively promote the public good. (italics part of original text)[34]

Higher education serves human needs. It provides the objective information necessary to help individuals perform well in the workplace, to behave effectively as citizens in their communities, and to exercise control in their personal lives. Higher education's goal is to provide individuals with facts and the necessary skills to use the facts to arrive at decisions designed to improve their own circumstances in relation to others with whom they live.

Its focus encompasses the general universe of human activity. At its best, it serves as an integrative agent, joining in a reasoned and humane way all of the disparate parts of life. If higher education's primary concern becomes survival on an economic plane, its overriding purpose can be distorted. Industry is primarily concerned with making a profit. As a result, its motives and behaviors are not always consistent with those of higher education.

If colleges are not careful about the effects of their cooperation, their primary role can be subsumed. If this happens, the colleges can become little more than adjuncts of industry's public relations or training offices.

An example of the potential difficulties college/industry relationships can cause is contained in the December issue of *Energy Currents*. The issue focused on the developing oil shale industry in northwest Colorado. The college, with two other higher education institutions, has been working with 27 mining firms in the area to create training programs to produce a workforce for the fledgling industry. In regard to the college's relationship to the industry, a college official writes:

> The history of boom towns in this country has raised some ugly specters. Already sharp rises in alcoholism, divorce, crime, and pollution have occurred. Taxes from oil shale production to support new utilities, schools, and social services will not be available to any degree until 1985, and it is uncertain how much money can be provided by the companies and the government now. The colleges, in some respects, find themselves in a dilemma. They feel responsible for doing their part to ensure the area's economic development by directly aiding new industry, yet they have strong commitments to their existing programs, to the rural community they serve (some of which are not in the path of oil shale development), and to their fragile mountain environment. An ethical question also concerns them: What balance should be struck among their solar, coal, and oil shale programs? Their interests are sometimes in conflict with one another.[35]

A complex set of issues arises from the situation.

1. How much investment does the college make in an industry when some of the consequences of industrial development are negative for the community?
2. While training a workforce for the new industry, how does the college ensure that students are full-dimension individuals; i.e., that students understand the technology as well as the social, personal, and environmental consequences of production?
3. What degree of program and faculty redirection is tolerable to accommodate the huge demands of the new industry?
4. What effects will a large, new effort in oil shale training have on alternate energy instruction that the college has been expanding in the last few years? And what faculty conflicts might develop or intensify as a result of the philosophical differences faculty espouse in the distinctive programs?

Responses to these questions are not easy. To one degree or another, all colleges that work closely with industry face them.

But this example is not an isolated one. The issues have surfaced in other contexts. One example is the controversy over financial investments made by institutions in an assortment of international and nation industries with corporate philosophies and personnel policies that are

anathema to American ideals and interests. Another example is the contention over the paid positions some university scientists have taken (while maintaining their university ranks) in profit-making genetic engineering firms.

In each of these cases, the purpose of higher education is blurred by a too-close liaison with industry. The distinction must be kept sharp if higher education is to preserve its unique national role.

2. Many cooperative agreement programs provide job-specific, narrowly-focused training. While such training may prepare individuals for existing jobs, it does not provide students with broad instruction that could help them advance in a firm, crossover within a firm to other related positions, or take advantage of opportunities emerging with other companies. Job-specific training can severely limit employability. It can confine people to *a* job in *a* company. These jobs tend to be low-paying and without advancement potential. This training provides a clear service to industry, but its long-term usefulness to students is negligible. Whenever it is possible, training should include general skills development to qualify students for positions in a cluster of occupational areas.

3. Colleges should also be careful not to place too much emphasis on these programs as primary sources of funds to support the entire institution. Changes in company directions, in profit margins, and in administration, and well as the state of the national economy, can alter the justification for whatever funds a firm has committed to them. Substantial cooperative agreements with a failed or severely reduced firm can undermine the strength of an institution.

4. The vitality of an institution depends on the quality of the programs it offers. Quality control in every college program area is essential if the college is to maintain its reputation as a valuable community resource. The quality control provisions and procedures of a college should be applied to all of its programs generated to suit the needs of industry.

5. Finally, college program activity with industry should not be limited to the stated needs of the firms involved. Sometimes there are opportunities for colleges to suggest to industry officials that they could benefit from the services of trained technicians they had not perceived themselves. For example, University College of the University of Cincinnati developed an Energy Management/Auditing Technology program and sold its graduates to local industry when no jobs requiring these qualifications and skills formerly existed.

For this program, the college took the initiative in diagnosing existing energy-related problems within local firms, establishing a training curriculum that would produce skilled technicians who could help resolve the problems, and convincing employers to hire the graduates. The college used a thorough, problem-solving process to establish the program. Part of the selling process included this letter to area employers:

> We have conceptualized Energy Management/Auditing as a new paraprofession in which the subject matter is taken from business, engineering, and energy in a unique combination. The result of this integration is a two-year associate degree graduate who is capable of managing the utilization of energy in the facilities, auditing the distribution of energy consumption, and who has basic knowledge of maintenance and repair of equipment that has to do with energy. The graduate can recommend modification when necessary and supervise maintenance personnel to preserve or conserve energy usage. In addition, the Energy Manager/Auditor is able to understand and be a part of the business management team. We believe that an Energy Manager/Auditor would be able to reduce the costs of energy and energy waste, thereby increase profits to the organization.[36]

The model programs described in this paper tend to be small. They represent an exiguous portion of total college services. As a result, the dangers noted here are minimal. The concerns, however, should be part of any deliberation involving college relationships with industry.

Conclusion

The American Society for Training and Development (ASTD), a national organization whose membership consists mainly of training and development officials in private firms, reports that the private sector spends approximately $30 billion annually for training. ASTD calls this figure "conservative".[37]

The AFL-CIO estimates that it spends in the neighborhood of $80 million a year for training, and the International Brotherhood of Electrical Workers reports expenditures of between $10 and $15 million a year.[38]

The state of the national economy may limit increases in private sector support for education and training in spite of the significance of these activities for improving productivity and the incentives that the federal government is providing to stimulate them. Reductions are possible. Even the wealthy firms are suggesting that they do not want, nor can they afford, to expand their training programs. They would much rather share the training burden with institutions in the established educational system.

Smaller, newer firms, those responsible for creating the largest percentage of new jobs and for generating the most innovation, cannot afford to provide for employee training.

The interest of industry to work with postsecondary institutions is demonstrated by the selected models presented in this paper. A gas company official made the connection forcibly when he said before a national conference on energy manpower needs, "We, as a vital U.S. industry, and you, as those who are training the work force industry must draw upon, have much in common."[39]

In addition to working toward reducing the great numbers of skilled trades positions that are unfilled now and those projected for the future, the most critical educational needs for the workforce are ". . . strong basic skills (communications and math), the ability to work with others, plus the need to educate and train people more broadly to give future employees more job satisfaction, make them more valuable to their companies, and thus less likely to be replaced."[40] These needs are compatible with the experience, interests, and capabilities of two-year colleges.

Cooperative agreements between business and colleges make excellent sense. They are consistent with the charge of the Reagan administration for local communities to take command of their own lives and circumstances, for organizations with common interests to work together, and for the private sector to take more responsibility for social programs in the community.

These partnerships may be especially crucial in energy activities as the support withdrawal of the federal government, particularly from conservation, alternative, and renewable energy development, leaves them with only local bases for assistance.

One of the business participants in the November 6, 1981, meeting on cooperative agreements hosted by AACJC's Energy Communications Center concluded the day-long discussion with the thought that ". . . we must put our shoulders to the wheel . . ." if we are to solve our nation's economic problems. He was talking about the need for industry and education to come together. It was a well-aimed remark.

Appendixes A and B, Footnotes, and Bibliography

Appendix A

Development of Federal Economic Policies Since the 1930s

Federal administrations have shaped their national economics policies on different principles over the years.

Before the Franklin Delano Roosevelt years, Adam Smith's theories influenced federal policies. Smith was an 18th century British economist and philosopher whose major economics work was *Wealth of Nations* (1776). He viewed the economy as a dynamic, self-controlled set of activities. In his conception, the interplay between production, consumption, employment, and costs altered as one element or another changed, but the result was always a healthy balance. He described a "pure market economy" in which the price of the same product – no matter what company produced it – was the same, employment was full, and competition between producers was unimpeded by outside influences. Also, he assumed that consumers had full knowledge of products and their prices and that consumer purchasing decisions would be based on logical preferences.[41] In the Smith system, the federal government only kept law and order.

Until the 1930s, most economists believed that the market economy tended to operate at full capacity. If the amount people spent was insufficient to buy everything produced, then the prices would fall. When prices fell, money could buy more, output would rise, and full employment would be achieved again.[42] However, with the advent of the Great Depression, it became obvious that a market economy left to itself could operate below full employment for a long time.

Since the early 1930s, the U.S. government has modelled its fiscal policies on the theories and strategies of John Maynard Keynes, a 20th century British economist and financial expert who wrote *The General Theory of Employment, Interest, and Money* (1936).

Keynes stressed the importance of government intercession to stimulate national economic growth while keeping inflation in reasonable check. In today's language, his approach might be termed demand-side economics for demand triggers the mechanism. According to Keynes, the total demand for goods and services (called aggregate demand and meaning the general willingness of people to trade their dollars for goods and services) determines employment levels and business investment activity.[43] Ideally, the quantities bought at particular prices equal the

amount producers want to sell. When buyers are willing to buy more at each price level, producers will respond over time by increasing their plant capacity. As production increases, so does the demand for labor and more workers are employed. Income from production is increased and is passed along as wages, salaries, profits, dividends and other means.

One result is that personal income rises. And as personal income rises, consumer spending rises – but by a smaller amount. According to Keynes, workers will save some of their additional income.[44] These savings may be tapped by businessmen through bank loans for further investment.

In Keynes' scheme, the government's responsibility is to monitor business activity and inflation.[45] When business productivity wanes, the government must stimulate movement through spending programs (especially income transfer and education and training programs that ensure personal income and increase the trained manpower pool) and through tax cuts. In inflationary periods, the government must suppress demand through increased taxes and reductions in spending programs. Thus, in Keynesian economics the national government guarantees prosperity and a relatively fair distribution of income by balancing the rate of aggregate demand with a corresponding rate of national production.[46]

In Keynes' conception, recession and inflation are dichotomous. When one condition exists, the other can not. Until the mid-1970s, the principle applied. Then, simultaneous high levels of unemployment and inflation occurred. Successive administrations had to choose between two contradictory goals – lowering unemployment or fighting inflation. They chose to fight inflation.

President Nixon attempted to lower the inflation rate primarily through wage and price controls. In August of 1971, the President imposed a ninety day price freeze followed by three phases of mandatory wage and price ceilings. The inflation rate was relatively constant during the freeze and Phase II, when wage and price increases were strictly controlled. Inflationary pressures were not alleviated as manufacturers who had difficulty obtaining permission to pass along increased costs found their prices below equilibrium and were unable to meet their customers' demands.[47] When the controls were relaxed between 1973 and 1975, the inflation rate rose rapidly. The 1972 world food crisis and the Organization of Petroleum Export Countries' decision to quadruple oil prices in 1974 contributed to rising prices.

President Ford chose to fight inflation with a tax increase. The action proved ineffective, as the Federal Reserve Board (the independent federal organization that controls the amount of money in circulation) refused to cooperate by holding the money supply steady. As a result of these incongruous policies, interest reached double-digit rates and such uncertainty was produced that the economy fell into a recession.[48]

In late 1978, the Carter administration proposed that monetary policy be tightened to slow demand growth. Monetary policy controls the amount of money in circulation. Generally, when the money supply is free-flowing, inflation is stimulated; when it is tightened, inflation is depressed. The administration hoped that a controlled money supply would slow down demand growth and, as demand dropped closer to production levels, prices would fall.[49] The President also asked for voluntary compliance with wage and price standards. He believed this step would diminish the tendency of businesses to tie prices to wage increases and to expect that the process would continue indefinitely. Among the effects of these policies, however, were increased interest rates and drops in bank lending. The slowdown in demand growth was delayed and the voluntary wage and price standards were ineffective. Prices and wages remained steady or increased and production fell.[50]

All of these policies were consistent with Keynes' theories. Yet, they did not produce the anticipated results. Instead, consumer price inflation rates were 13.3 percent in 1979 and 12.4 percent in 1980, the highest since World War II. Interest rates for short-term credit reached 20

percent, the highest level since the Great Depression. Homebuilders and buyers, farmers, small businesses and others found it nearly impossible to borrow. Federal spending grew at about 16 percent per year over this period, incurring a public debt of more than one trillion dollars ($1,000,000,000,000). In order to pay for the expanding aid programs, federal income taxes for the average family increased 67 percent in the last five years, while hourly earnings, adjusted for inflation, declined. Fewer individuals were able to save their earnings, thereby eliminating the investment capital for new plants and equipment. American productivity continued to decline. Now, almost eight million Americans are unemployed.[51]

In his televised address to the nation on February 5, 1981, President Reagan said: "It's time to recognize that we've come to a turning point. We're threatened with an economic calamity of tremendous proportions and the old business-as-usual treatment can't save us. Together, we must chart a different course."

His "different course" is sharply different from that taken by previous administrations. He breaks with traditional Keynesian ideas and seeks to attack both inflation and unemployment by redefining the role of the federal government. In the Reagan approach "free market forces" determine production levels and employment. The balance between growth and inflation is the charge of the private sector, not the government. The government's role is to retreat from direct involvement with the market place and to eliminate or reduce existing federal programs that restrict private enterprise. In contrast to the demand-side strategies of earlier administrations, Reagan's focus falls on supply-side economics.

According to Reagan, federal government initiatives have depressed production and encouraged only consumption, through high taxes, excessively rapid money growth and government regulations. By cutting back government growth and returning the country's resources to the states and individuals through a series of tax cuts, Reagan predicts an environment for "work, savings, and investment" that will foster an innovative, growing ecoonomy. Under the President's plan, budget cuts and strict monetary policy will control inflation (see footnote 20). While the federal government will continue its support of the military and ensure the welfare of dependent groups of citizens, it will no longer attempt to control demand (see footnote 21). Rather, the government will spur supply to achieve economic growth and lower inflation.

To increase the supply of goods and services, the President has proposed an Economic Recovery Plan consisting of four parts:

1. Reduction of tax rates for both workers and industry
2. Strict limitation of federal expenditures
3. Elimination of government regulations that are judged unproductive and unnecessary
4. In cooperation with the Federal Reserve Board, reduction of the money supply growth rate.[52]

Brief details on each of these parts are presented below.

Taxes

The President has requested that Congress reduce the marginal tax rates (the amount of tax on increased income) by 5 percent for 1982 and 10 percent for the following two years.[53] A tax reduction will also be applied to unearned or investment income, eventually eliminating the differential between earned and unearned income. Other major individual tax provisions include: tax cuts for child care expenses in connection with employment; exclusion from tax of up to $75,000 of foreign earned income in 1982; and extension of the period an individual is allowed to defer taxes on proceeds from the sale of a house if the money is used to buy another home of the same or greater cost.[54]

To offset inflation, there will be an automatic adjustment of income taxes (indexing) beginning in 1985. Individual tax brackets, the zero bracket rate (the amount of income on which there is no tax) and the personal exemption will be annually adjusted by the average increases of the Consumer Price Index (a statistical measure of the price changes of goods and services purchased by consumers computed by the Department of Labor) of the preceding year. Indexing will mean an individual will continue to pay the same portion of wages in federal taxes though his/her taxable income may increase with inflation.[55]

For business, the primary tax cut will be a simplified, accelerated depreciation plan. Estimates of plants and equipment wear will be grouped in four classes, each with a standard set of deductions for a specified recovery period of three, five, ten, or fifteen years.[56] This approach (the Accelerated Cost Recovery System) will eliminate the discrepancy between historical (the original costs) and replacement costs of assets. Other business tax cuts include the reduction of the lowest corporate income tax rates, the immediate deduction of small businesses of the cost of new machinery and equipment, a 25 percent tax credit for new spending on research and development, and increased corporate deductions for contributions of new equipment for use in university and college research.[57]

Reagan administration officials believe these tax measures will create the following flow of results:

- Individuals will be encouraged to work more, since their after-tax income will be greater;
- Both individuals and businesses will increase their savings;
- Businesses will invest more, financed in large measure by the increased personal and business savings;
- Higher investment will lead to increased production and jobs;
- Since the supply of goods and services will rise, prices will come down; and
- As inflation diminishes and industrialists become more confident of recovering costs and earning a profit, economic growth will continue.[58]

Federal Spending

To counter the loss of tax revenues, the administration has moved to reduce the size of the federal government, reduce its role in controlling the economy, and curtail the growth of federal spending.

Some federal support programs that are scheduled for reductions or elimination include welfare, the Food Stamp Program, Export-Import Bank loan authority, the Economic Development Administraton, school breakfast and hot lunch programs, subsidies to the arts and humanities, the Trade Adjustment Assistance Program for workers, the space program, education, and energy.[59] According to the administration, an estimated $49.1 billion will be cut from the federal budget in fiscal 1982.[60] Most of the savings will be diverted to state and private sector use.

To increase efficiency and return authority to states and localities, a variety of categorical grants programs will be consolidated into a few block grant programs. The block grants will allow state and local governments to judge what their own best interests are and to use the monies appropriately.[61]

From the administration's perspective, the program reductions and redirections will contribute to a more productive use of economic resources and will ensure that the federal government does not compete with private enterprise for financing, a competition that has pushed inflation higher and stagnated economic expansion.

Administration officials also predict that any other budget deficit will be overcome as the economy and the tax base expand. Individual income tax cuts will create an incentive for individuals to work harder knowing their efforts will being them a higher disposable income. With each increase of income, individuals will be put in a higher tax base. The increase in the tax base will yield more revenue at the reduced tax rate.[62]

Regulations

To encourage production expansion, the administration has proposed the elimination or moderation of regulations that it judges have diverted resources from investment, causing higher prices for goods and services. Administration steps include: (1) establish a Task Force on Regulatory Relief, chaired by Vice President Bush, (2) abolish the Council on Wage and Price Stability (the Council monitored economic indicators such as costs and wages and determined the effect of federal government activities on inflation), (3) postpone pending regulations, (4) sign an Executive Order to oversee the improvement of Federal Regulatory Process management, and (5) decontrol the price of domestic oil.[63] The administration also wants to accelerate the decontrol of natural gas. It anticipated that these actions will reduce the administrative costs of the regulatory agencies and the concomitant costs to business incurred in regulations compliance. They are expected to provide further incentive for investment.[64]

Money Supply

In the final part of the Economic Recovery Plan, the Federal Reserve Board, in cooperation with the administration, will restrict the growth of the money supply. When the total demand for goods and services is greater than the supply, prices increase. To support higher prices, the money supply must eventually increase. An excessive increase of the money supply leads to more spending and inflation. By restraining money growth, the supply of money will equal the productive capacity of the economy.

The Reagan Administration believes that budget cuts and a strict monetary policy will not only reduce inflation but alleviate the pressures behind it. Since 1952, the government has been spending more than it has received in tax revenues. To finance deficit spending, the federal government sells government securities. The huge amount of borrowing necessary to support the deficit has increased the demand for loanable funds and interest rates. To keep interest rates from rising, the Federal Reserve System increased the money stock.[65] Monetary expansion without an accompanying increase in production has led to greater inflation.

Furthermore, the Administration predicts that by reducing federal spending and restricting money growth, interest rates will fall. The lower interest rates will attract sufficient investment to absorb the full volume of predicted savings.[66]

If the theory applies in practice, the impact of the Reagan Economic Recovery Plan on the economy will be substantial. As the economy grows, more and newer production facilities will be built, more labor will be demanded, more research will be carried on, and innovation and technology will advance further. With the full plan installed, the administration expects that production will expand, productivity will improve, employment will increase, and inflation will be controlled and reduced.

Appendix B

Formal Written Agreement between Edmonds Community College and Snohomish County Public Utility No. I

PROFESSIONAL SERVICE CONTRACT NO. 457

District Purchase Order No. 73601

This Agreement is made and entered into this 2nd day of February, 1981, by and between Public Utility District No. 1 of Snohomish County (hereinafter called the "DISTRICT"), P.O. Box 1107, Everett, Washington 98206, and Edmonds Community College (hereinafter called the "COLLEGE"), 20000—68th Avenue West, Lynnwood, Washington 98036.

WHEREAS, the COLLEGE is required to provide its students enrolled in the Energy Management Program with on-the-job training in an energy-related field whereby students can obtain Cooperative Education credits toward a degree requirement; and

WHEREAS, the COLLEGE desires to provide practical on-the-job experience to enrich its program to all of its students; and

WHEREAS, the National Energy Conservation Policy Act, Public Law 95-619, November 9, 1978, (NECPA) requires that the DISTRICT develop a program to conduct Home Energy Analyses as defined herein: and

WHEREAS, the DISTRICT presently has a backlog of requests for such audits; and

WHEREAS, the parties desire to create a program to be known as the P.U.D. Consumer Home Energy Check (PUD-CHEC);

NOW, THEREFORE, it is hereby agreed by and between the parties as follows:

1.0 SCOPE OF WORK—During the term of this agreement, COLLEGE shall:

1.1 Employ or assign its students to conduct home energy analyses within the service area of the Snohomish County Public Utility District. As used in this agreement, "home energy analysis" means a survey in which data on a customer's home energy use is gathered by the COLLEGE and entered into a computer terminal device in the customer's home. The computer terminal analyzes data and provides a printout of the calculations to the COLLEGE, who reviews with the customer appropriate conservation practices and measures. A copy of the printout is left with the customer.

1.2 Arrange for or employ at least nine (9) qualified students to conduct energy analyses during the term of the agreement. The COLLEGE shall conduct home energy analysis on Friday, Saturday and Sunday of each week during the term of this agreement and shall attempt to complete a minimum of three (3) energy analyses per day and 81 per week. The minimum length of a home energy analysis shall be two (2) hours.

1.3 Submit a progress report every week to the DISTRICT on a form approved by the DISTRICT. Each student shall be required to submit an activity report to be attached to the progress report. The activity report form shall be provided by the DISTRICT.

1.4 Provide a coordinator to act as liaison between the DISTRICT and the COLLEGE.

1.5 Recruit students for the program as necessary to perform the work described in this agreement.

1.6 Submit to the DISTRICT a list of student applicants for the PUD-CHEC Program for its prior review and approval.

1.7 Schedule students aproved by the DISTRICT for participation in the program for particular audits from the list of appointments provided by the DISTRICT. The COLLEGE shall not schedule any appointments with DISTRICT customers unless authorized by the DISTRICT in writing to do so.

1.8 Arrange for a drop-off and pick-up place, or places, as approved by the DISTRICT, for the energy analysis equipment and Texas Instrument terminals.

1.9 Assign energy analysis equipment and Texas Instrument terminals to students and shall keep a record of these assignments.

2.0 DISTRICT RESPONSIBILITIES—During the term of the agreement, the DISTRICT shall:

2.1 Designate a coordinator to answer questions and assist the COLLEGE. This coordinator shall make random checks on the student's performance to examine compliance with DISTRICT's Home Energy Analysis procedures acquired during any training required and provided by the DISTRICT.

2.2 Not pay for or provide reimbursement for any transportation expense of the COLLEGE, its students officers, agents or employees.

2.3 Provide all equipment necessary to perform a home energy analysis. A list of equipment and procedures on use, delivery and return of the equipment shall be provided by the DISTRICT.

2.4 Provide the COLLEGE with a list of scheduled appointments at least seven (7) days before the date of each schedule energy analysis.

3.0 INSURANCE—The State of Washington, its agencies and departments presently self-insure all their general liability exposures, including automobile liability. Claims costs are not submitted to a commercial insurer, but are funded by the State through the Tort Claims Revolving Funds.

Tort claims properly filed against the State are processed as prescribed in the Tort Claims Act, Chapter 4.92 of the Revised Code of Washington (RCW). In summary, the code states that individuals may sue the State (RCW 4.92.010), the State may provide legal defense for officers and/or employees against whom claims are filed (RCW 4.92.070) and judgments against the State and/or employees may be paid by the State (RCW 4.92.130).

The DISTRICT shall not provide automobile liability insurance for the individuals working under this contract. Each person will be required to provide his/her own automobile insurance for their vehicle.

4.0 RELATIONSHIP OF THE PARTIES—It is understood that the COLLEGE is a state agency. Furthermore, it is understood that the COLLEGE is an independent contractor in the performance of its obligations under this agreement. Neither the COLLEGE nor any of its officers, students, agents or employees shall be employees of the DISTRICT for any purpose. Each party shall be responsible for the negligence of its own employees, agents or students in the performance of this agreement.

5.0 REMUNERATION—The DISTRICT shall pay thirty dollars ($30.00) to the COLLEGE for each and every completed computerized home energy analysis as described above according to the record of such analysis contained in the DISTRICT's data base. COLLEGE shall be paid every two (2) weeks following completion of analyses and reports. COLLEGE, its agents, officers and employees, shall not be reimbursed for any expenses or costs, including but not limited to, transportation cost, except for this $30.00 payment which shall be COLLEGE's only compensation for any work performed pursuant to this agreement.

6.0 PERIOD OF PERFORMANCE—The term of this agreement shall be from February 6, 1981 to December 31, 1981.

7.0 CERTIFICATION—The COLLEGE agrees that any and all students or employees used in the performance and the work described above shall first complete a training program provided or required by the DISTRICT and shall first obtain any certification now or hereafter required by the DISTRICT before the COLLEGE will use them in this PUD-CHEC Program.

8.0 CARE, USE AND RETURN OF EQUIPMENT—The COLLEGE agrees to be responsible for any negligence of its employees, agents or students while the DISTRICT-owned or leased equipment is under the care of the COLLEGE and to be responsible for any damage or liability arising therefrom.

9.0 TERMINATION--Either party may terminate this agreement by giving written notice to the other of such termination and specifying the effective date thereof at least ten (10) working days before the effective date of such termination. In that event all equipment and paperwork regarding an analysis of a customer's home shall be returned forthwith to the DISTRICT. If the agreement is terminated by the DISTRICT as provided herein, the COLLEGE shall be paid for all audits actually performed and completed prior to the termination date.

10.0 NON-EXCLUSIVE CONTRACT—The DISTRICT reserves the right to enter into a similar contract with any other company, person, or independent contractor to perform the same or similar work at any time during the term of this agreement or any extension thereof.

PUBLIC UTILITY DISTRICT NO. 1
OF SNOHOMISH COUNTY

BY: _____
W. G. Hulbert, Jr.

TITLE: Acting Manager

EDMONDS COMMUNITY COLLEGE

BY: _____
T. C. Nielsen

TITLE: President

BY: _____
T. Harker

TITLE: Director, Business & Finance for District 5

Footnotes

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